

AUGUST 1919 ~ No 163

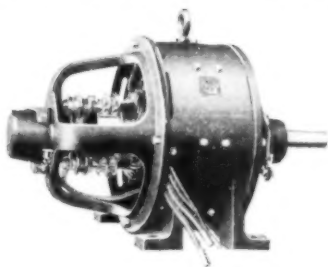
Monthly

A Reference for Buyers

HITCHCOCK'S
**MACHINE
TOOL LIST**

Distributed Free to Machine Tool
Users Everywhere in the United States and to
Dealers in American Machinery Abroad

Published by
A-H HITCHCOCK
1220-1235 Caxton Building
Chicago



They stand hard service

Type T Reliance Motors are built to stand hard service and to stand it longer than the ordinary motor. Results have proved that they do. They represent the combined experience of 35 prominent electrical engineers in the big steel mills and machine shops.

Type T motors are supplied for both constant and adjustable speed service.

Bulletin 2014 gives details.

Reliance Electric & Engineering Co.

1050 Ivanhoe Road, Cleveland, O.

BRANCHES: Boston, New York, Philadelphia, Pittsburgh, Chicago

Type T Heavy Duty
RELANCE MOTORS
Direct Current



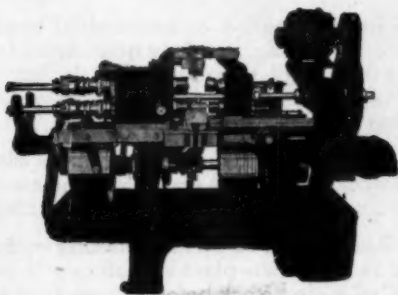


STILL GROWING

Every year the list of
satisfied users of
Acme Automatics
grows larger

The real reason behind that satisfaction is the actual production that these machines continually turn out.

Why not more of *your* work, *automatically*?



Capacities up to $3\frac{3}{4}$ " diameter

THE NATIONAL ACME COMPANY

NEW ENGLAND PLANT
WINDSOR, VT.

Cleveland, Ohio

CANADIAN SCREW PLANT
MONTREAL, P. Q.

Branch Offices:

NEW YORK BOSTON CHICAGO DETROIT ATLANTA SAN FRANCISCO
WAREHOUSES—NEW YORK, CHICAGO With FOREIGN REPRESENTATIVES

Makers of Gridley Single and Multiple-Spindle Automatics at Windsor, Vt., and Acme Automatics, Threading Dies and Screw Machine Products at Cleveland, Ohio



“Flint Shotting”

scale from hot-rolled or heat-treated stock before machining, not only quadruples (at least) the life of the roughing-tools, but it retains the life of cutting compounds which *pickling* kills.

Hereafter, in buying carbon steel or alloy steel stock specify and insist that it be sand-blast cleaned with *Flint Shot*—and *not* pickled.

Better still, install a sand blasting equipment in your own plant so you can “Flint Shot” *all* scaled stock before it goes to your lathes, drills, planers, die-presses, or other tools.

Our Book “Little Journeys of the Flint Shot Man” will tell you more about this.

United States Silica Company

1941 Peoples Gas Bldg.,

Chicago, Ill.



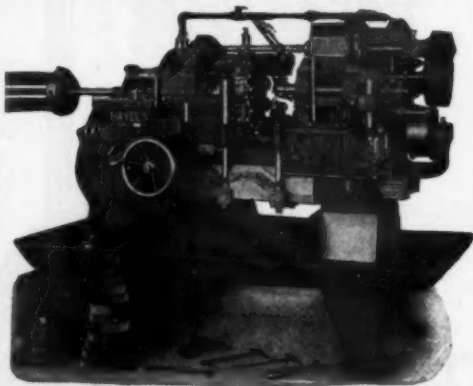
Attention

Prompt
Shipment
on

Brown & Sharpe
Milling Cutters

Providence, R. I., U. S. A.

**Not 14 Points But 48
Every One a Point of Superiority**



The Cincinnati 5-Spindle Automatic

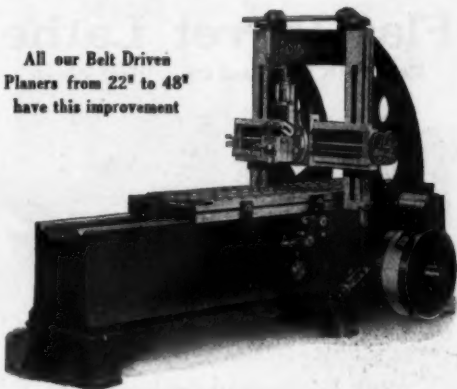
Its piece-production time is measured, not in minutes, but in seconds and fractions of a second. It is easy to set up, easy to tool, easy to operate, because the features that make for rapid, accurate, economical production are built into the machine—they are inherent in the design itself. Hence the output of a Cincinnati Automatic does not depend upon the operator. Give it ordinary intelligent handling and the machine will do the rest.

These 48 points wherein the Cincinnati Automatic excels are worth studying; write for our catalog and look them over.

Cincinnati Automatic Machine Co.
Oakley, Cincinnati, Ohio

The Cincinnati Patent Tu-Speed Drive

All our Belt Driven
Planers from 22" to 48"
have this improvement



With this Hi-Lo drive, the cutting speed is changed from slow to fast, or the reverse, by merely moving a conveniently placed handle; the return speed is constant, and faster, of course, than either of the cutting speeds. The change is made instantly, and while the machine is running, involving nothing more complicated than the mere shifting of a belt, as from a tight to a loose pulley.

The advantages of this drive are important, because they increase both the convenience and efficiency of the machine. If the change were troublesome to make, much work would be—and on many planers frequently is—done at slow speed that should run faster; because it is easy, you get the right speed on the "Cincinnati" for all work.

And the right speed is the speed that pays.

*All Cincinnati Planers save money
Let us tell you how and why*

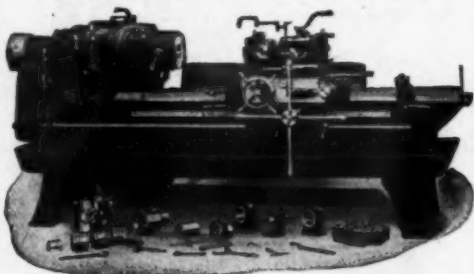
The Cincinnati Planer Co.
Cincinnati, Ohio, U. S. A.

CINCINNATI-ACME

**3 1/4"x36" Bar Cap.
36" Chucking Cap.**

Flat Turret Lathe

For Both Bar and Chucking Work



With Equipment for Bar Work

With the cost of skilled labor mounting higher and higher, the only relief is from the use of tools which reduce production time to the minimum.

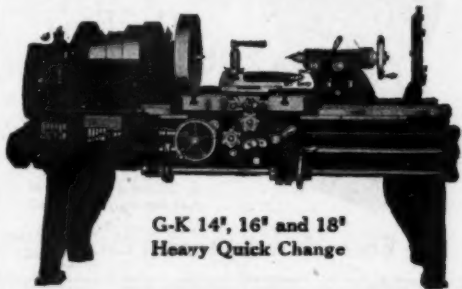
In the production of detail parts in quantities, the Cincinnati-Acme, which is the most rigid turret lathe made, has made many remarkable records. It is a tool of great productive capacity and remarkable accuracy.

If in doubt, submit your proposition to us. If we can't help you we will frankly say so, and it may be that you, like many others have done, will find that the Cincinnati-Acme is just what you have been looking for. And why delay?

The Acme Machine Tool Co.
Cincinnati, Ohio, U. S. A.

Why Betterments?

An Interesting Question We
Would Like to Answer



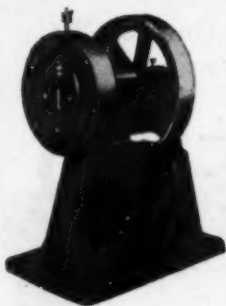
G-K 14', 16' and 18'
Heavy Quick Change

When we say that Greaves-Klusman Lathes have G-K Betterments, it means something to lathe users, something we believe is important. We cannot tell you about them in this space—the story is too long—but we have compiled a little book called "G-K Betterments," which describes them fully, and this we shall be glad to send you. You will find it interesting and informing, and it may point the way to a reduction in your manufacturing costs. It is sent without obligation, of course.

May we suggest an immediate requisition for it?

The Greaves-Klusman Tool Co.
Cincinnati, Ohio, U. S. A.

Often Multiplies Output 5 to 10 Times



In the pointing, tapering or reduction of stock to circular form,

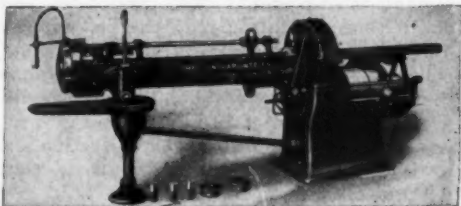
The Etna Rotary Swager

often multiplies production 5 to 10 times over power hammers. Accurate to a few thousandths of an inch—no flat spots.

*Isn't it worth your while to
look into its possibilities?*

**The Etna Manufacturing Co., TOLEDO,
OHIO**

**This is only one of the
11 TYPES — 5 SIZES
Ask for a complete catalog**



J.N. LAPOINTE CO.
NEW LONDON, CONN.

Makers of Broaching Machines and Broaches.



Making More Gears and Making Them Cost Less

**These Are the Special Functions of
the Superior Automatic Gear Hobbers**

This improved machine has been developed especially as an economizer, as a saver of labor, time and overhead. It accomplishes its purposes by producing gears of the highest attainable accuracy at a rate which materially lowers the cost per unit.

Necessarily it embodies a number of distinct and even radical improvements over hobbers of older types—improvements which cannot well be described in this space. We therefore ask the privilege of submitting them to your judgment. If accurately cut gears are an essential element of your production, we know a description of the Superior Automatic will interest you.

Your request for it involves no obligation

Jones Superior Machine Company
Chicago, Illinois

CLARENCE E. KINNEY,

Formerly with the

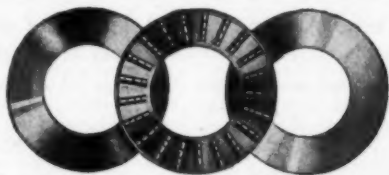
SYMINGTON PROPERTIES,

has become associated with

OGDEN R. ADAMS,

of ROCHESTER, N. Y.,

in the capacity of General Manager
and Sales Engineer.



BEARINGS

LIGHT DUTY

HEAVY DUTY

ALL TYPES

MANY SIZES IN STOCK

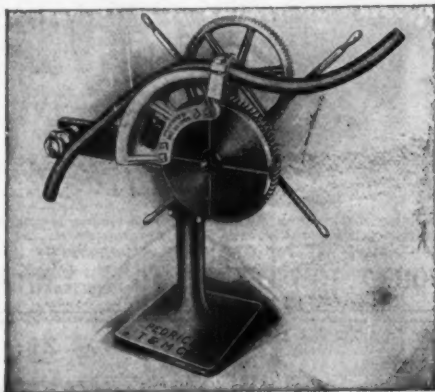
THE GWILLIAM COMPANY

ENGINEERS

253 WEST 58th ST., (at Broadway), NEW YORK

Branch, 1314 Arch St., Philadelphia

Our Pipe Benders Meet The Demand



Ever since their invention our hand Pipe Benders have had a steady sale and have given universal satisfaction.

Recently, we have made some improved attachments that permit of a wider range of work and open up a new field in the kind of bending the machine will accomplish.

If you do pipe bending you will find our machine an economical, simple and very efficient appliance in reducing costs and doing better work. For 2" and under.

We have a Bulletin waiting for you. Send for it now.

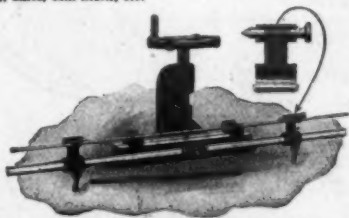
Pedrick Tool & Machine Co.

3644 N. Lawrence St., Philadelphia, Pa.

Manufacturers of Cylinder Boring Bars, Portable Millers, Crank Pin Turning Machines, etc.

Towsley Straightening Machine

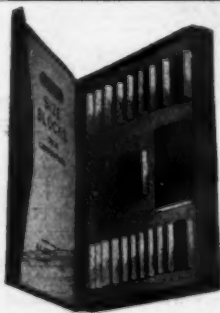
ONE MAN, with this improved machine, can quickly and noiselessly take bends and short kinks out of bar stock up to 48"x2½" before it is put into the lathe. Also invaluable for repair work on bent journals, spindles, shafting, axles, cam shafts, etc.



With special shaped tools, it is easily adapted to bending, pressing and straightening tubing, channel, angle and tee iron, auto axles, etc.

Better have full data. Will you write for it?

JOHN T. TOWSLEY MFG. CO., 1037 Woodrow St., CINCINNATI, OHIO



A Set of 21

LOWAY

Size Blocks

Only \$17.25

The first complete set of Size Blocks offered at a price which permits their being checked out freely to the workmen, and not kept under lock and key. They are so useful for laying out work

on the bench, setting it up on the machine, inspecting, checking, etc., that at the price offered they should be in every shop.

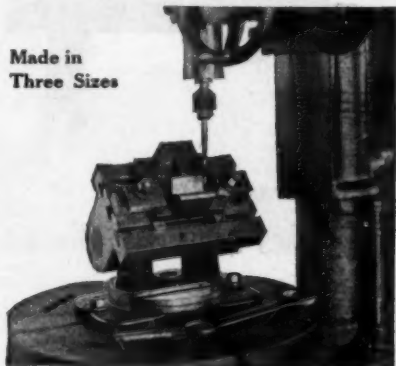
Our system of lettering, with reference table, shows at a glance the blocks to be used to secure any dimension.

A. F. WAY CO., Inc., Hartford, Conn.
Export Department, 77 Broad St., New York City

The Reid is Always Reliable

A universal angle fixture making instantly available any exact angular position

Made in
Three Sizes



AS A TIME AND TROUBLE SAVER in tool room and experimental department, this handy fixture stands second to none. It permits a mediocre mechanic to make set-ups in record time, while the adjustments are such as to do away with all possible chance of error.

Users find it invaluable for die sinking, tool and experimental work. It will help your men to drill, mill, plane, shape and grind accurately. The double vernier gives instant readings to 1-12th of a degree—with a sine bar even finer ones. The fixture swivels 360 degrees horizontally and 180 degrees vertically. The design eliminates all overhang.

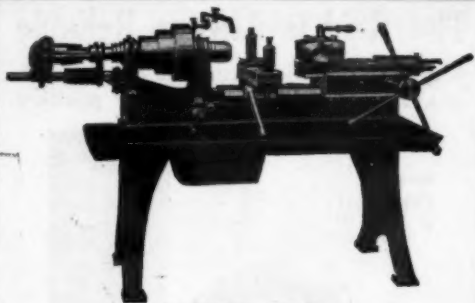
Let us explain fully—for economy's sake

Reid Bros. Co., 59 Park Street
Beverly, Mass.

Export Department, 77 Broad St., New York City

English Agents, Oliver Natchy, Co., Ltd., 201-03 Deamgate, Manchester, Eng.

Also Manufacturers of the Reid Surface Grinder



MODEL "D"

Turret Lathes and Screw Machines

Now Ready for Delivery

**Designed for Rapid Manufacturing of
Parts Requiring Several Operations**

MADE IN FOUR SIZES:

- No. 2 { $1\frac{1}{8}$ " Wire Feed Capacity, Plain Head
 { $1\frac{3}{8}$ " Hole Through Spindle.
- No. 3 { $1\frac{1}{8}$ " Wire Feed Capacity, Plain Head
 { $1\frac{1}{2}$ " Hole Through Spindle.
- No. 4 { $1\frac{1}{8}$ " Wire Feed Capacity, Geared Head
 { $2\frac{1}{8}$ " Hole Through Spindle.
- No. 5 { $1\frac{1}{8}$ " Wire Feed Capacity, Geared Head
 { $2\frac{3}{8}$ " Hole Through Spindle.

**With or Without Power Feed to Turret Slide.
Mechanically Perfect and Fully Guaranteed.**

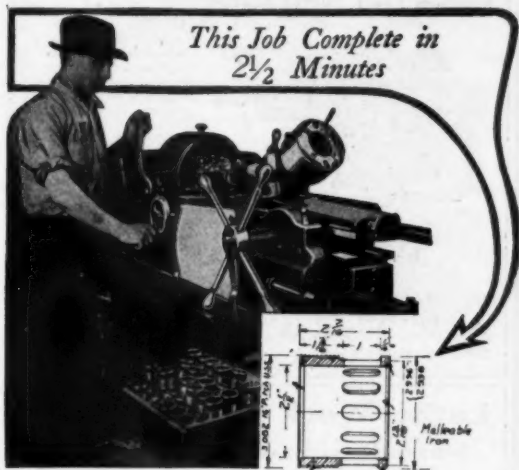
Manufactured By

Smurr & Kamen Company

328-330 N. Albany Ave., Chicago, Ill.

THE TILTED TURRET

ANGLE TRACK THE STOCK



*This Job Complete in
2½ Minutes*

The TILTED TURRET MACHINES

are accurate and productive.
Fifteen years' of thoroughly
tested service. A size for
every class of manufacturing.

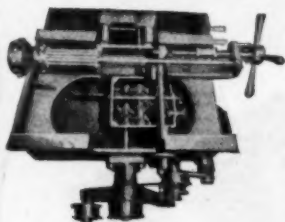
Ask the User

Catalog "H"—Its Free

WOOD TURRET MACHINE CO.

BRAZIL INDIANA U.S.A.

New Gear Feed for Jones & Lamson Friction Feed Turret Lathes



If your J. & L. Friction Feed Turret Lathes are not giving the desired production, don't discard them, but equip them with our Special Gear Feed.

Repeat Orders

give us most of our business, which is good evidence of satisfaction. Easy to install, or we will install at cost and make any desired repairs on your J. & L. Turrets.

Why not bring them up to date at light cost?

A. V. Wiggins & Co., Dept. H
384 W. Fayette St., Syracuse, N. Y.

Lathe Work Speeded Up

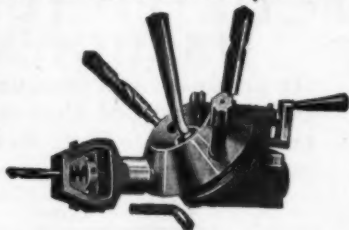
Newman Turret Transforms Common Lathes

Indispensable if you have no turret lathe. Invaluable in emergencies. Efficient on short or long runs.

Will fit
any lathe

Attach in
15 seconds

Sent on
trial



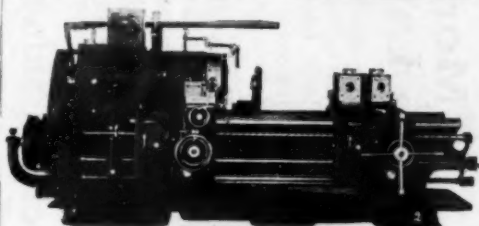
Write us today; state outside diameter of tailstock spindle

NEWMAN MANUFACTURING CO., Cincinnati, O.

STEINLE TURRET MACHINE CO.

MADISON, WISCONSIN

Originators of the Heavy Duty Full Swing Side Carriage Turret Lathe



Steinle 24" Full Swing Side Carriage Turret Lathe

Machine is regularly furnished belt driven or arranged for motor drive.

Actual swing over ways.....	24"
Swing over side carriage.....	21"
Diameter of hole through spindle.....	4" or 6 1/4"
Traverse of side carriage and of turret carriage.....	56"

Both carriages have independent quick change feed and independent power traverse all controlled from carriage aprons.

Side carriage can be run past the chuck and is equipped with cross slide having power cross feed and with turret tool block having four tool holders.

There are thirty reversible spindle speeds available. One belt or one motor furnishes power for all functions of the machine.

Turret is massive and designed particularly with a view to rigid support of tool equipment.

Send us drawings of gas engine fly wheels, cylinders where cast singly, pistons, and piston rings. Let us give you production estimates and the cost of tool equipment for these and other pieces and also let us tell you the time required to change the tool settings for the different pieces.

Numerous repeat orders received from many of the principal manufacturers of tractors, trucks, aviation motors, marine gas engines, and stationary engines demonstrate the satisfactory results obtained from the use of our machines.

Monarch Lathes

give universal satisfaction to the user. They have been doing this for years, and this accounts for the ever increasing demand for **Monarch Lathes.** Built in all styles and with any attachments desired.

Sizes 10 to 30-inch Swing

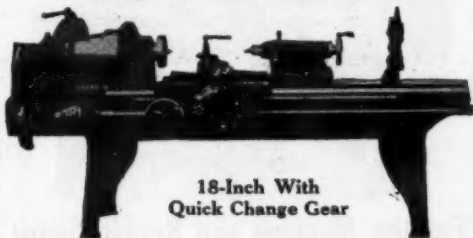
*Sold by a leading Machinery Dealer
in every machinery center.*



The Monarch Machine Tool Co., Sidney, Ohio

Before You Buy A Super-Quality Chard

**We Want You to Be Satisfied That
the Super-Quality Really is There**



**18-Inch With
Quick Change Gear**

That is why we ask the privilege of telling you the story of its construction; of showing you what "Super-Quality" means, and just how we build it into every lathe that bears the Chard name plate.

It will be highly worth while to you to know about the Chard, because if you have use for a lathe of highest grade, it will mean dependable accuracy in your work, and no doubt lowered costs, for our experience shows that the quality of the Chard means not only satisfaction, but economy to the user.

*Made in Sizes 16", 18", 20", 24" and 28"
Of what size machine shall we send information?*

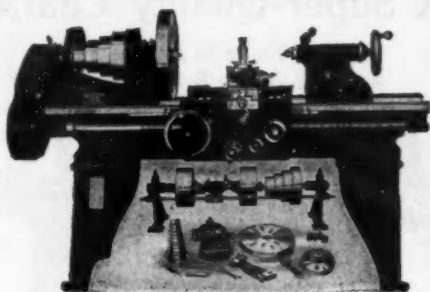
Chard Lathe Company

Newcastle, Ind.

DOMESTIC DISTRIBUTORS

THE F. O. STALLMAN SUPPLY CO., San Francisco, Cal.
VONNEGUT MACHINERY CO., Indianapolis, Ind.
ENGLISH & MILLER MACHINERY CO., Detroit, Mich.
OGDEN R. ADAMS, Rochester, N. Y.
THE W. M. PATTISON SUPPLY CO., Cleveland, Ohio.
J. S. MILLER MACHINERY CO., Pittsburgh, Pa.
MONARCH MACHINERY CO., Philadelphia, Pa.
DALE-BREWSTER CO., Chicago and New York.

South Bend Lathes



For the Machine and Repair Shops

South Bend Lathes are made in six sizes—13", 15", 16", 18", 21" and 24" swing, with beds from 4' to 16' in length. Furnished with either straight or gap bed.

South Bend Lathes have been on the market thirteen years. Over 20,000 in use. Dealers in every large city.

13" Lathe.....	\$ 256	18" Lathe.....	\$ 600
15" Lathe.....	336	21" Lathe.....	771
16" Lathe.....	432	24" Lathe.....	1085

Price includes equipment as shown in illustration

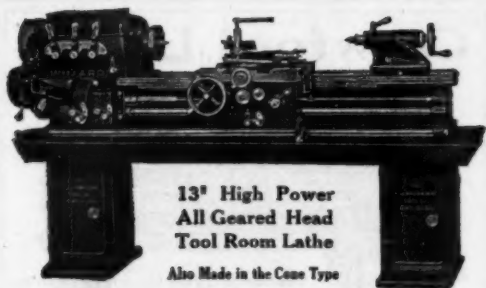
Send for free Catalog illustrating and describing entire line

South Bend Lathe Works

Established 1906

South Bend, Ind.

430 E. Madison



**13" High Power
All Geared Head
Tool Room Lathe**

Also Made in the Cone Type

Willard Lathes

The Headstock of our All Geared Head Tool Room Lathe is a full box section, internally ribbed and fully self-contained, with selective speed changes inside the headstock. It is impossible to throw in two different speeds at one time. There are six different speeds available when clutch is thrown in and six more through the back gears—12 in all. All gears are chrome nickel steel and all sliding gears are hardened.

The Spindle is chrome nickel steel, forged and bored from the solid, ground to accurate size and guaranteed interchangeable, with phosphor bronze bearings.

The Compound Rest has a top slide composed of a steel casting, and no breakage is possible. The bottom slide is graduated for any angle up to 90 degrees.

The entire construction is consistently high grade, with great power, accuracy, convenience and permanent alignment, insuring an output that is unusual in its combination of quality and quantity.

Willard Lathes are made in all styles

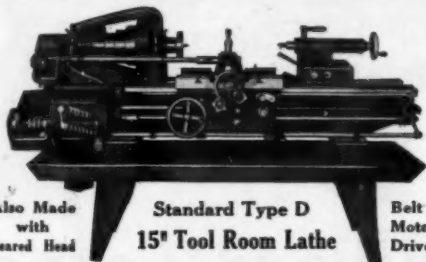
Write for description of our Tool Room or Engine Lathes, either All Geared Head or Cone Type.

The Willard Machine Tool Co., Inc.

F Street, Box 784

CINCINNATI, O., U. S. A.

Crawford Lathes



Also Made
with
Geared Head

Standard Type D
15" Tool Room Lathe

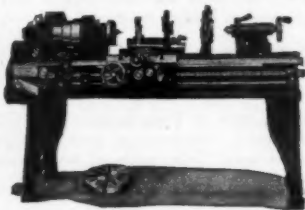
Belt or
Motor
Drive

Made for a discriminating trade and to give satisfaction under the most exacting conditions.

Crawford Machine Tool Co., Inc.
21 Park Row, New York

"Filsmith" is of Simple Design

And Unusually Powerful in Action



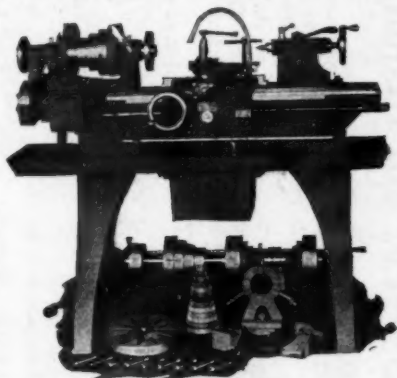
14" and 16" Swing
3-Step Cone
Double Back Gear
Q. C. Gear Box
Any Length Bed

Of rugged construction, it has great power for its rated swing. The new features embodied are an aid to production—give us an opportunity to acquaint you with the facts.

PHILIP SMITH MFG. CO., SIDNEY, O.

"Worcester" 12" and 14"

Tool Room And Manufacturing Lathes



12"x4" "Worcester" Tool Room Lathe

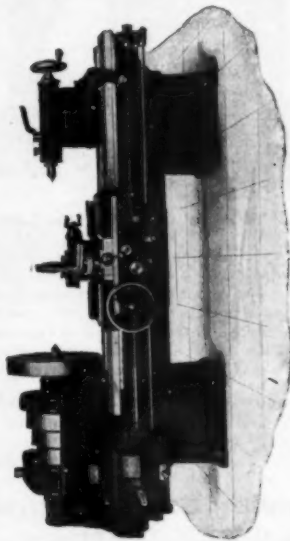
The above illustration shows the usual equipment, which includes an oil pan of pressed sheet steel; pump, piping and removable oil reservoir; a taper attachment fixed to back of carriage, which is well made, accurate, graduated in degrees and always ready for use; and a draw-in chuck. No extra attachments needed; each machine is complete in itself.

Also made with Geared Head for Motor or Single Pulley Drive, and in the Manufacturing type.

Write for description of these quality lathes

Worcester Lathe Company
68 Prescott St., Worcester, Mass.

SIDNEY LATHES—For All Requirements



The Sidney Line of medium and heavy duty lathes includes a lathe for every class of work, regardless of the size or type of shop you are running.

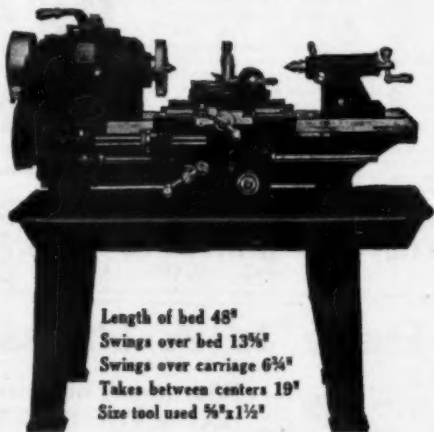
Lathes of medium duty in 14, 16, 18 and 20-inch swings, and of heavy duty in 15, 17, 19, 25, 27, 30 and 36-inch swings.

Send for Bulletin No. 45.

THE SIDNEY MACHINE TOOL CO., Sidney, Ohio

Adams Short-Cut Lathe

Is a Sensible Selection for the
Rapid Production of Short Parts



Length of bed 48"
Swings over bed 13½"
Swings over carriage 6½"
Takes between centers 19"
Size tool used ¾"x1½"

DON'T take the time of your big lathes for turning short duplicate parts in quantity, when you can get a small, short lathe like the "Adams Short-Cut," which is specialized to do just that kind of work to better advantage in every way. It costs less, takes less room, consumes less power, and is quicker and easier to handle. It is a big producer of accurate work within its capacity.

Hadn't you better look it up? Your address?

O. R. Adams Manufacturing Co., Inc.
Rochester, N. Y.

WILLARD O. B. I. Power Press

We used to make these presses in a little shop upstairs, years and years ago. They were good presses then; they are even better now, for we have gained in experience, and they are now made in a modern plant with all up-to-date facilities.

They have many points of special merit suggested by our long experience, and are without their superior for any kind of blank cutting, punching, perforating, forming and bending of sheet metal.

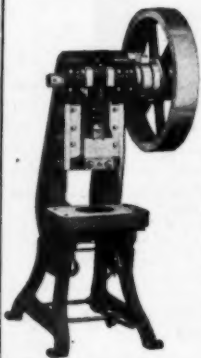
Write for specifications and you'll want the Press

The Willard Press & Tool Co.
Cincinnati, Ohio



Here Is A Press

With Plenty of Steam
Back of THE PUNCH



HIGH DUTY
ROCKFORD
PUNCH PRESSES

Made in straight side and inclinable types. Their great power backed by rigid design enable them to do the work you demand and stand up to it.

Write For Catalog

Rockford Iron Works
Rockford, Ill.

"THE SMALL LATHE FOR THE BIG JOB"

"DALTON SIX"

**METAL WORKING
LATHE**
Actual Swing 7 1/4 Inches
MODEL TYPE "B-4"
30 OR 36 INCH LENGTH OF BED



Standard Machine
Mounted with Standard
Type High Legs



Taper Attachment Fitted
onto our Machines



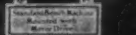
Standard Machine
Mounted with Cabinet
Type High Legs



Standard Bench Type



Machine with Half-Driving
Wheel in a Machine with
Cabinet or Taper Attachment



Standard Bench Machine
Mounted with
Motor Drive



Machine with Motor
Drive



Standard Machine, High
Legs, with Wheel and
Lever Type Tail Stock



Motor Driven Machine
with Cabinet High Leg

**MANUFACTURED BY
DALTON MANUFACTURING CORPORATION
NEW YORK, U.S.A. CABLE ADDRESS "DALTON" NEW YORK**

COMPLETE BULLETINS SENT ON REQUEST

Emco Bench Press



EMCO "W" Bench Pwr. Punch Press

Weight, lbs.,----130

Stroke,--- $\frac{3}{4}$ " or $1\frac{1}{4}$ "

Capacity,-- $\frac{3}{4}$ "x1-16"

For rapid production on Small Parts

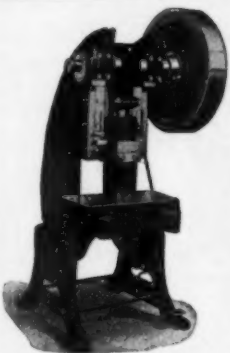
Used in quantities by many large operators.

Specials—Iron Stand, Die Block, Inclining Blocks, Motor, Counter.

Absolute non-repeat stop on one stroke.

Made absolutely accurate for die and other fine work.

The Enterprise Machinery Co., 26 S. Clinton St. CHICAGO, ILL.



L-J Inclinable Power Presses

The cut shows our No. 4 Fly-wheel Press, capacity 34 tons. Made in several sizes; the larger sizes also furnished in the geared head and combination geared types.

Our Dealers

Stocker-Rumely-Wachs Co., Chicago
W. J. Baird Machinery Co., Detroit
Herberts Machinery & Supply Co.,
Los Angeles and San Francisco, Cal.
J. L. Lucas & Son Inc., Bridgeport, Conn.
Brown-McDonald Mch. Co., St. Louis
Northern Machinery Co., Minneapolis
Clark Machinery Co., Cleveland, Ohio
Patterson Tool & Sup. Co., Dayton, O.
Dale-Brewster Mch. Co., New York
Swind Machinery Co., Philadelphia, Pa.

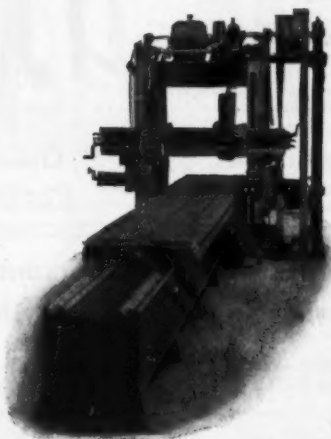
Write to the nearest, or

Loshbough-Jordan Tool & Mche. Co.
Elkhart, Indiana

48"x 48"x 16'

Bickett Planer

Belted Motor Drive



Send for Catalogue "B"

Some agency territory still available

The Bickett Machine & Mfg. Co.
Cincinnati, Ohio

Partridge Light Punch Press

For making novelties from sheet metal, including such operations as stamping, blanking, piercing, bending, forming, perforating, embossing, shearing and wire cutting. Has exceptional strength for its size.

Carefully adjusted to secure accurate working of the dies, and to prevent shearing. Pendulum action of lever gives a stroke of maximum power without tiring operator. Workmanship and material the best.

Write me for the interesting price

E. O. PARTRIDGE, 2041-2049 W. Lake St., CHICAGO

Also Bench, Column & Cabinet Grinders, Polishing Lathes, Light Punch Presses, Hollow Mills, Countershafts, Chuck Arbors and Saw Mandrels



Get the best from your workmen by providing a place for everything

The Ritchie -Wertz Modern Bench

is carefully designed to provide a place for everything, including stocks, tools, blueprints, etc., etc. Large users find that they increase efficiency by permitting their mechanics to work systematically. They promote system, the greatest of economies. You cannot

expect the maximum of skill and production from your mechanics if they have old style benches strewn with litter. Get acquainted with the new way.

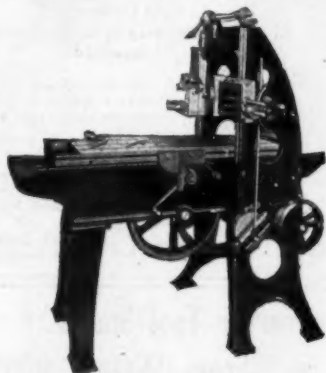


Write for particulars

THE RITCHIE-WERTZ CO., Dayton, Ohio

If It Fits Your Work You Want It

Because it will save you money



16x16x42' and 16x16x54'

There is marked economy in using this small planer for your small planing. It takes less time to set the work, and less to do it, because the small machine is more easily and quickly manipulated, while in accuracy and effectiveness it is equal to largest planer made. The saving in investment, upkeep and operating cost is an item worth considering.

A Big Machine of Small Size

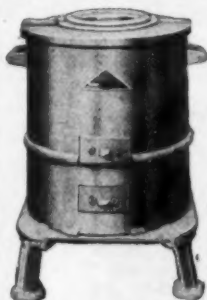
No trouble to send full description; ask for it

The Frank H. Lee Co.

MACHINERY DIVISION

Danbury, Conn., U. S. A.

"Triad" 3-Purpose Lead and Cyanide Bath Furnace



Heating for

- (1) Hardening in the Lead Bath
- (2) Hardening in the Semi-Muffle Furnace
- (3) Forging in the Combustion Compartment

With only one oil or gas burner, tool steel temperature can be obtained in 35 minutes from a cold start.

Temperature always uniform in the entire pot. Eliminates oxidation. Gives better results at less cost.

Write for Catalog No. 5

The W. R. Bennett Co., P. O. Drawer X
Elmwood, Conn.

No Hammer or Tool Marks From "Grant" Riveting



Yes, a boy or girl can operate the "Grant," and it heads a rivet a second as tight or loose as desired, but in addition to these good qualities *it is noiseless and it gives the finest finish to the rivet head.*

The Grant Rotary

RIVET SPINNING MACHINE rolls or swedges the rivet—a noiseless operation which produces highly polished rivet heads without marks of any kind.

Several styles. Write for Catalog.

The Grant Mfg. & Machine Co.
C. E. Station, Bridgeport, Conn.

Riveting Revolutionized

"The Hammer with the human stroke"

Heads Rivets Cold



Heads 'em tight or loose, flush, countersunk, or finishes heads any shape desired at the rate of:—

A rivet a second, sizes up to 3-16 in.

A rivet in two seconds, sizes 1-4 to 3-8 in.

A rivet in three seconds, sizes 7-16 to 5-8 in.

Built in Eight Sizes

To handle rivets from the smallest, up to 1½" in diameter. Send us sample assembly parts with rivets or sketch of your work, and let US shoulder your riveting problems.

Send for the High Speed Hammer Book

Department 13

The High Speed Hammer Co., Inc.

Rochester, New York

Castellating Machine



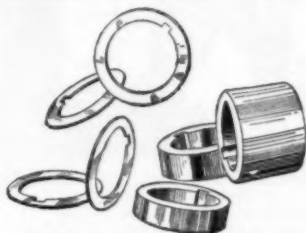
Production on one-fourth to one-half inch Nuts

400 to 700 per hour

Does a clean, accurate job.

Enquire of your dealer or write us for full details.

THE CRAFTSMAN TOOL CO.
CONNEAUT, OHIO



Don't

let your men cut paper or tin washers for your milling machines. You can get steel washers .003, .004, .005, and .006 thick at \$3.00 per C giving you a variation by the thousandth. We also make collars from $\frac{1}{8}$ " to 3" long for the various arbors.

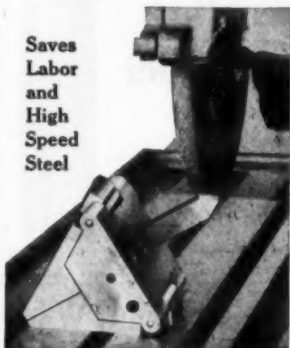
The Unity Manufacturing Co.
4229 Lorain Ave., Cleveland, O.

The Boss Jig

For Holding Thread Cutting Tools

**While grinding 29 degrees acme, or 60 degrees
U. S. standard, or any degree between 29 and 60**

**Saves
Labor
and
High
Speed
Steel**



The slotted screw in center of face controls the various angles required by turning, which causes the hinged wings to move in and out.

Clearance on thread tool is automatically provided for as the hinged wings are offset the correct degree to produce clearance.

Has containers for 3/8" and 5/16" tools; also furnished in special sizes.

The thread tool is accurately ground on both sides and top without removing from the jig.

**Retail price \$15.00, delivered anywhere in the United States.
We shall be glad to quote terms to jobbers upon request.**



The biggest little tool made; better order today

G-L Sales Company

Sole Distributors

521-523 W. 26th St., New York City

Taper Keyseating

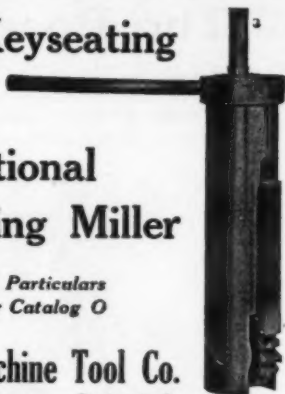
with

The National Keyseating Miller

*For Full Particulars
Write for Catalog O*

National Machine Tool Co.

2266 Spring Grove Ave., Cincinnati, O.



Pat. Jan. 30, 1917

Just What I Want



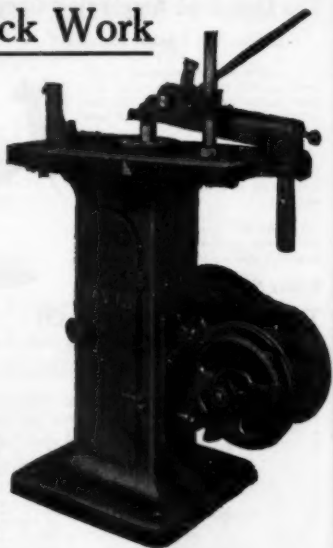
Automatic Extension Reel for Electric
Lamps.
Light just where wanted.
25 ft. of cord.
Automatically locks and rewinds.
Approved by underwriters.

The Cincinnati Specialty Mfg. Co., Inc.
1913-21 Powers St., Cincinnati, Ohio

Branch Offices:

285 Abbott Bldg., Philadelphia, Pa.; 39-41 Cortlandt St., New York City

Modern Methods for Quick Work



A DAVIS KEYSEATER

Motor driven, will save you valuable space as well as increase your production. It is an investment you can't afford to overlook.

Write for Circular

DAVIS MACHINE TOOL CO., Inc.
ROCHESTER, N. Y., U. S. A.

Better Gauging---and Quicker

The Universal Amplifying Gauge

Insures You Against Inaccuracy

It amplifies the minutest variations so that they can be read at a glance, and works so quickly that parts are gauged as fast as a man can handle them.

No special skill required; we put that into the gauge, so that anybody can use it, and be sure of results.

Let us tell you what it is doing for others, so you may judge how much it will help you.

Catalog No. 100 explains; ask for it



THE NORTH SIDE TOOL CO., Dayton, Ohio

Manufacturers of Special Tools, Dies, Jigs and Fixtures



Davie Gauging Machine.

Graduations in .0001

Height 17" — Length 15" — Width 9"

BURTON, GRIFFITHS & CO., Ltd.
Ludgate Sq., Ludgate Hill, London, E.C.

Agents for Great Britain

SOC. ANONIMA ITALIANA ALFRED HERBERT, Milan, Italy. Agents for Italy

For inspection work where limits are close and accuracy and speed essential

1. Measuring Plug Gauges in readings of .0001
2. Measuring Interchangeable Parts in readings of .0001
3. Measuring Drill Jig Bushings in readings of .0001
4. Measuring Pistons in readings of .0001
5. Measuring Ball or Roller Bearings in readings of .0001
6. Testing Concentricity of Form Milling Cutters .0001
7. Testing Concentricity of Spindles of various designs .0001
8. Setting Shop Disputes over Micrometer Readings
9. Speeding up Production Gauging

Any attachments to suit your needs
The Davie is Standard Throughout America and Europe

is in use in The Ford Motor Plant Alone

Send for catalog

The Davie Tool Co.

E. 118th & Euclid Ave., Cleveland, O.

SOC. ANONYME ALFRED HERBERT

47 Boulevard de Magenta, Paris

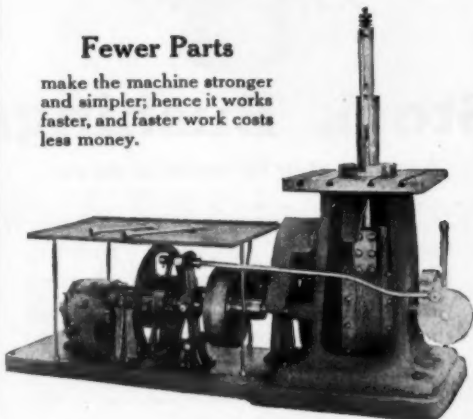
Agents for France

Agents for Italy

Keyseating Costs
Why Not Lower Them?
The Catlin will do it

Fewer Parts

make the machine stronger
and simpler; hence it works
faster, and faster work costs
less money.



Combine speed with accuracy and you have a practical and efficient machine. The Catlin Keyseater works to one-thousandth of an inch, or less, requires no special skill in operation, and owing to the ease with which the work is handled, its production rate depends mainly upon the activity of the attendant in placing and removing work.

If you have keyseating to do, and are interested in what you pay for doing it, the production and cost records which our customers are making ought to make profitable reading for you. Let us send them, with a complete description of the machine itself.

Chattanooga Machinery Company
Chattanooga, Tenn.



Stock Bushings

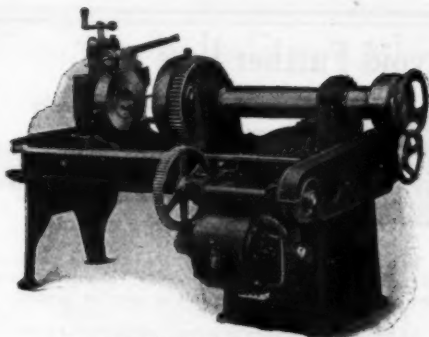
Another step forward in service

We now carry, made-up, ready for immediate shipment Bunting Plain Bronze Bushings in stock sizes ranging from $\frac{5}{8}$ " to 2 3-16" inside diameters; and in lengths from 1" to 5". "Bunting Phosphor Bearing Bronze" is used on all stock bushings.

Bushings of special alloy, flanged and special design bushings, also babbitt lined bearings made on order, from patterns and tools supplied by us.

Ask for "Stock List" and Quotations

The Bunting Brass & Bronze Co.
754 Spencer Street, Toledo, Ohio



(No. 3 Peerless. All Gears are Covered)

Why do B. & K. Machines Excel?

Kindly note the following:-

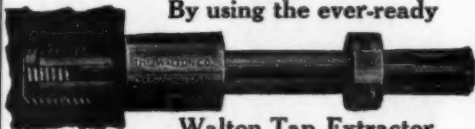
- 1 They embody the general excellence of 34 years' manufacturing experience. We have profited by the many hard tests given them under all sorts of conditions.
- 2 All machines are equipped with a gear box drive for obtaining the proper threading speeds. This eliminates all uncertainty or guess work in selecting the right speed for threading each size of pipe.
- 3 Dies can be changed without removing a screw, and when the die is removed, the die slot can be cleaned without removing the cover.
- 4 A rotary oil pump supplies oil to both the dies and cutting-off tool. The pump is gear driven, not with belt, which soon becomes oil soaked.
- 5 The cutting-off tool is made of beveled high speed steel which requires no reforging.
- 6 Each machine has a reaming attachment for removing the burr.

Write for Catalog and consult us about your needs

Bignall & Keeler Machine Works
Edwardsville, Ill.

Avoid Further Loss

By using the ever-ready



Walton Tap Extractor

To have a tap break is really bad enough, without the further expense of a high priced mechanic wasting a lot of your valuable time digging out the pieces.

The Walton makes it easy to remove any broken tap from No. 8 to 1 1/4" without injury to the threads. We offer you a 60-day free trial.

Send us your name and address today

THE WALTON CO., Hartford, Conn.

Blueprints

The Wickes

Continuous Electric.
Sells at **half** the
price. Uses **half**
the current
of others.
Perfect prints
up to 48" in
width and of
unlimited
length.



Dept. H

Wickes Bros., Water Street,
Saginaw, Mich.

Practically Indispensable

The Universal Angle Plate



8"x10" Worm Adjusting—Made in Four Sizes

No matter what the operation is, milling, planing, boring, shaping, drilling or grinding, if it involves an angular adjustment of any kind, this plate will give it to you instantly and correctly. No fussing, no calculating; you read it directly from the graduations on the plate, and by means of the vernier attachment down to one-twelfth of a degree. Its accuracy is beyond question.

This is a patented device, containing improvements which we shall see are fully protected. They are essential to thoroughly good angle plate.

You will miss a splendid tool room and shop convenience if you do not use this plate wherever it can be applied to your work.

Let us show you

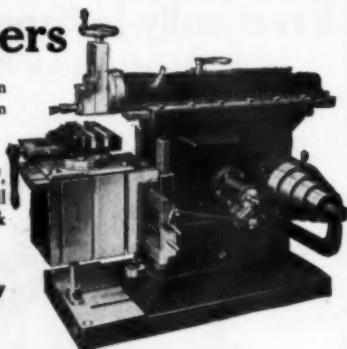
Boston Scale & Machine Co.
100 Ruggles Street, Roxbury, Mass.

Shapers

The best medium priced Shaper on the market.

Built in 16", 20", and 24" sizes, all back geared crank machines.

A few for early delivery.

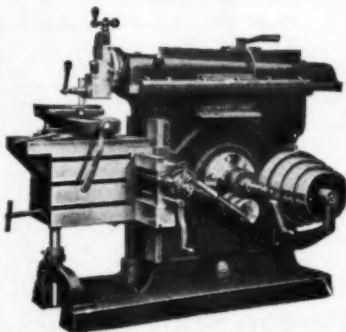


The Osborne & Sexton Mchy. Co.
Columbus, Ohio

SHAPERS

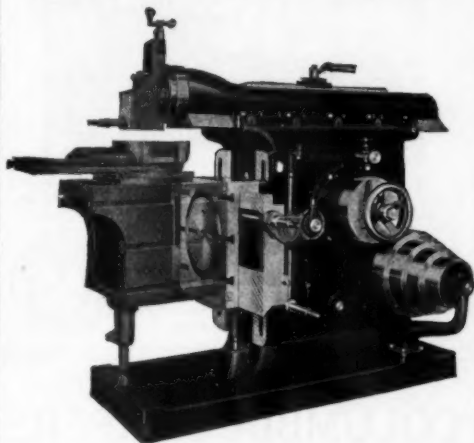
12", 14", 16"
Plain Crank,
16", 20", 25"
B. G. Crank,
either Cone
Driven or
through
Speed Box.

28" and 32"
Back Gear-
ed Crank,
Single Pul-
ley Drive.



The Smith & Mills Co. Station B.,
Cincinnati, O., U.S.A.

Milwaukee Shapers



MILWAUKEE Back-Geared
Crank Shapers are built in
16-in., 20-in. and 24-in. sizes.

UNEXCELLED in Rigidity,
Accuracy, Power, Production
and Simplicity.

Milwaukee Shaper Co.

1144-1146-1148 Holton St., 518 Prairie St.,
Milwaukee, Wisconsin

MORSE SILENT CHAIN DRIVES



For all transmission purposes. Flexible as a belt, positive as gears, and longer life than either. The facts are startling—better write for them.



Morse Chain Co.
Ithaca, N. Y.

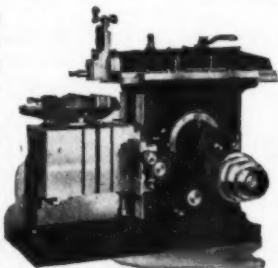
*Morse Engineering Service
Assistance Free*



HIGH GRADE, HEAVY DUTY COLUMBIA SHAPERS

Modern machines for modern requirements. In weight and capacity, in accuracy, convenience and durability, they stand supreme.

Investigate — Descriptive bulletin free, covering sizes 16", 20", 24" and 28".



The Columbia Machine Tool Company
Hamilton, Ohio

Keeps Machining Costs Down

Combines Efficiency, Accuracy and Economy

The
Correct
Tool
for
Small
Work



The Rhodes Combined Shaper and Slotter

Designed for small work, it is the machine par excellence for dies, tools and all small shaping and slotting. On this line of work it will do everything that a large machine will, do it faster, with equal if not greater accuracy, and at considerable less cost.

You will be agreeably surprised at the economy this up-to-date tool will afford, either as a horizontal 7½ in., a vertical 3½ in., or a combination of the two—in both floor and bench type.

Do not postpone your investigation—write us today

Rhodes Mfg. Company
Hartford, Conn.



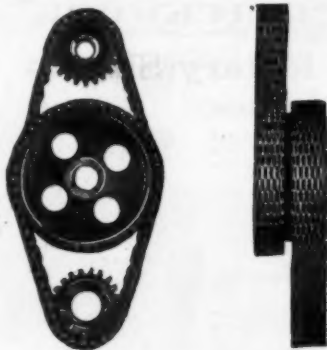
**Terrell's
Steel
Lockers
are a
valuable
aid to
contentment**

A workman's locker is the one little spot in the shop which is his own. It is private. It is personal. And when that one little spot is made attractive, safe and sanitary, it is worth a great deal to him as a man and is of even greater value to the employer in dollars and cents.

Terrell's Steel Lockers are an aid to contentment, and they afford a better investment than make-shift wooden fixtures. Their first cost is their only cost, and that may be less than you think.

You may tell us your requirements without obligation

Terrell's Equipment Company
Hall & Division Sts., Grand Rapids, Mich.
Also ask about Terrell's Steel Bins and Shelving



War Record Not Made Public

The "Whitney" Special Quality "Type M" Chains

made a great showing during the war years 1916, '17 & '18

Our tests and demonstrations were made on prominent 8-cylinder motors in service on a large number of cars owned in the State of Connecticut.

During this long period not a single "Whitney" Chain or Sprocket had to be replaced and the condition of every Drive has been pronounced remarkable.

One Drive recently examined had given over 35,000 miles' service and both Chains and sprockets were in such perfect condition that they appeared good for more than double that record (Sprockets having no adjustment).

The links of this SPECIAL CHAIN have finished faces and reamed holes, and the smooth faces do not damage the Sprocket teeth.

Our war contracts were such that we did not announce this SPECIAL CHAIN until after the conflict was over.

The Whitney Manufacturing Co.
Hartford, Conn.

"QUICKWORK"

REGISTERED U.S. PATENT OFFICE

Rotary Shears

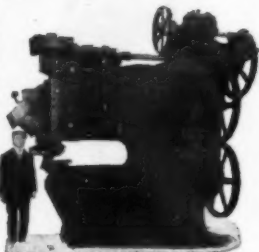
Made in 6 Sizes

Cut all gauges of sheet and plate metal up to 1 inch thick in straight or irregular shapes and openings without cutting in from side of sheet. Leaves square, true edge that requires no finishing. Used in building ships, boilers, tanks, cars & general plate and sheet metal work.

Save 50 to 90%

Eliminates Oxyacetylene cutting and plate planing

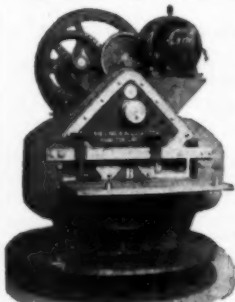
Write for catalogue



Patented June 3rd, 1913

THE QUICKWORK COMPANY, St. Marys, Ohio, U. S. A.

"Quality Line" of Punches and Shears



Our 300-page Catalog shows a complete line of power punches and shears, from the smallest to the largest.

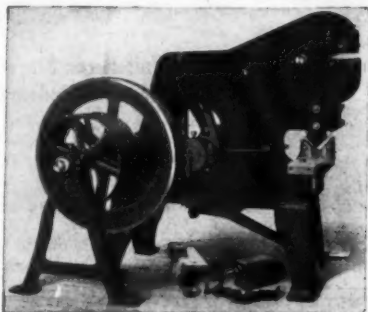
The cut shows an Angle-Iron Shear on turn-table, motor driven, for shearing right and left-hand angles up to 45 degrees. Capacity, 6x6x1 in. With or without turn-table. Belt or motor drive.

Write for Catalog 21-A

The Long & Allstatter Company

AMERICAN PUNCH AND SHEAR WORKS
Hamilton, Ohio

Punches—Shears—Bending Rolls
The Beloit
Combined Power Punch And Shear



Built in six sizes. Nos. 51, 52, 53, 54, 55 and 56

Direct connected motor or belt drive

This is the best all around punch and shear in a combined machine of moderate cost. It is heavy and substantial, and amply back geared to require the minimum amount of power; is strong, compact, and easy to operate. Can be equipped with angle shearing attachment, architectural jaw, or for special work.

We are putting out a complete line of punching and shearing machinery in both power and hand tools, also light and heavy duty bending rolls.

We do not overrate the capacities of our machines.

Write for catalogue and prices

Hendley & Whittemore Co.
100 S. State St., Beloit, Wis.



Dependable T. H. L. Punches

They have the kind of dependability that meets the demand for maximum production, for our experience gives us the "know how" to make them that way. They are—

Uniform in Size

Hardness and Endurance

and their use insures a steady, rapid delivery of uniform, accurate work.

Immediate delivery on all regular sizes; specials on short notice.

Try us out; you'll come again

T. H. Lewthwaite Machine Co.
415 East 31st St., New York City

No Adjusting Anderson Balancing Ways Are Always Ready



Fast running parts, such as shafts, air plane propellers, gin brushes, turbine rotors, everything that runs at high speed, must be accurately balanced. For this work the Anderson Ways are unequalled. The chilled iron discs are ground true on the face and perfectly balanced. Running in special ball bearings, they permit the part to

be balanced to rotate practically without friction, so that an accurate balance is easily obtained. Five sizes, for parts up to 10,000 lbs. weight, cover all requirements.

Prices and Particulars Promptly

Anderson Bros. Mfg. Co.
115 Morgan St., Rockford, Ill.

George A. Lewthwaite Punches and Dies



**Reliable for all machines
and all metals**

The service they give is our own particular concern, because we guarantee them absolutely, and if they fail in any way, we are right here to make them good. You take no risk whatever.

We want your trial order for the worst piece of work you have; it will make a satisfied, and gratified customer of you, for we know you will be as glad to have found dependable punches as we shall be to add you to our list of patrons.

Lewthwaite Shear and Rod Cutter

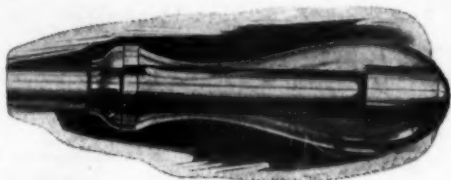
This handy tool is compact, convenient and easy to operate. You will find it just right for many jobs in your shop, for it has power to do easily shearing and cutting even beyond its rated capacity. It will earn its cost in a comparatively short time.



Also
**Pipe Benders
Bar Benders
Power Presses
Foot Presses
Etc., Etc.**

Get our Catalog of Iron-Workers' Tools for handy reference

George A. Lewthwaite Co.
116 Walker St., - - New York



Quick Action

This is what we call this new Machine Handle. Attached to any power tool, especially the heavier types; adjustments are made with more speed and less effort.

All kinds of standard and special Handles from steel for power tools and similar purposes.

Send for Catalogue and prices.

The Cincinnati Ball Crank Co.
Oakley, Cincinnati, Ohio



Style "C"



The Hinge



Style "Y"



Style "B"



Style "G"



Style "O"



Style "L"



Style "T"

GITS OIL CUPS

Give perfect satisfaction where others fail. State style and size in which you are interested, and we will send free samples and catalog.

GITS BROS. MFG. CO.
1940 SO. KILBOURN AVE., CHICAGO



Style "H"

Tucker's Safety First

Oil Hole Covers

Require but one hand to pump in the oil. Adapted to all kinds of mechanism having oil holes leading to a bearing, and locate the parts to be lubricated.

*Send for Catalogue
Oil Hole Covers No. 5*



Style G, Closed



Style G, Open

Style E



Style C



Style F, Drive



Style A



Style B



Style D, Open



Style D, Closed



Rotary Head

W.C. & F.C. TUCKER, Hartford, Conn.

Draw-in and Thrust Chucks

for Tool Room Lathes and Screw Machines. Look for the name "Hardinge Brothers" and write us. And did you ever ask us to make those—

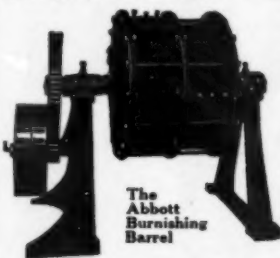
Screw Machine Collets

with regular or irregular holes? We are prepared to make good deliveries. Why not try us next time? Quantities never too small or too large to interest us.

When making inquiry, kindly refer to "Chuck Department".

Hardinge Brothers, Inc.
Chicago, Ill.

**Sure, costs are going up and up
But you can reduce BUFFING COSTS**



**The
Abbott
Burnishing
Barrel**

75 to 99 Per Cent

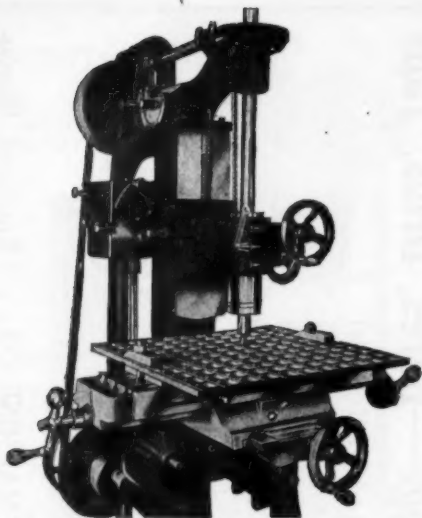
This is a remarkable and most pleasing reduction in these days of mounting costs, isn't it?

The Abbott Burnishing Barrel

burnishes by the bushel, which of course is cheaper than buffing one piece at a time. And it is a further surprising and agreeable fact that the work is also BETTER.

*All sizes of burnishing balls and soap chips for immediate shipment
Write for booklet and send samples for burnishing*

The Abbott Ball Company
Elmwood District, Hartford, Conn.



Helps Master Many Problems

EVERY SHOP has mechanical problems of its own, the solution of which often prove expensive. Mechanics in every part of the country have found Knight Milling and Drilling tools an invaluable help in doing difficult machining at minimum cost.

Their adaptability and great convenience was demonstrated in the work done on the mould shown above. It was difficult to do and required great accuracy, but it was mastered with the aid of a Knight. Our machines have many such records to their credit, and are ready for more.

Let us get you acquainted. What's your name?

W. B. Knight Machinery Co.

3920 W. Pine St., St. Louis, Mo.

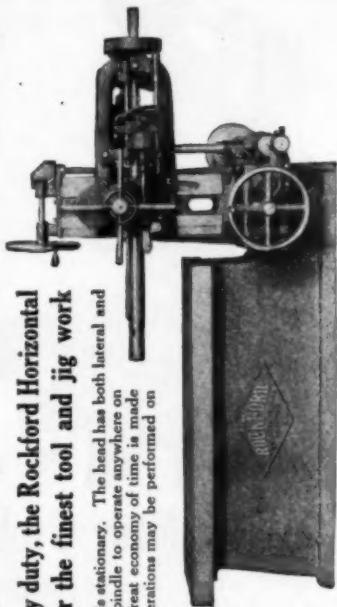
Of Exceptional Range—Bores, Drills, Taps

While built for heavy duty, the Rockford Horizontal has the accuracy for the finest tool and jig work

The table of this efficient machine is stationary. The head has both lateral and vertical adjustment, allowing the spindle to operate anywhere on a surface 18" high by 36" wide. Great economy of time is made possible because a number of operations may be performed on heavy, hard-to-handle work at one setting.

It has the power and capacity for 2" drills, and for boring to 6" or even more. It affords a choice of six driving combinations.

You will find the full specifications interesting — write us



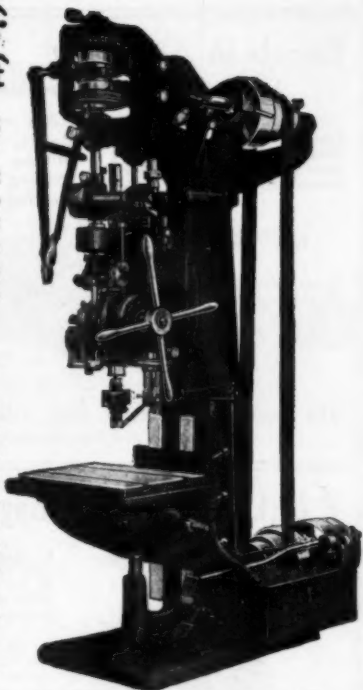
THE ROCKFORD DRILLING MACHINE CO., Rockford, Illinois

Turner Turret Records

in many different shops all go to prove the great economy made possible with this ultra-modern machine.

Speed

To drill, ream, tap and counter-bore at one setting—to complete a series of operations *in less time than has been possible heretofore* — is the secret of its success in lowering shop costs.



This automatic machine is as superior to the common drill press as the turret lathe is to the common lathe. It has great adaptability—it is solving new problems right along. An extremely wide range of speeds is afforded. Send us a sketch of one of your difficult problems and see what we can do for you.

Builders of QUINT TURRET. Ask for Bulletin QH

TURNER TURRET

Turner Machine Company
DANBURY, CONN. and Newark, N. J.
Incorporated with Turner, Atherton & Co., Ltd.,
Deaton, Manchester and Stockport, Eng.

Excels in Accuracy

Lambert Horizontal Boring Machine

Combines the closest accuracy with extreme simplicity and thorough efficiency.

**For
Boring
Milling
Drilling
Tapping**

Bronze bushings and all-steel gearing. Verniers provide head and outer support adjustments.



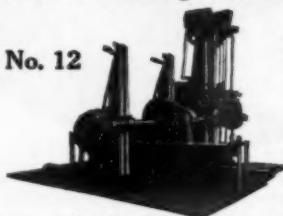
Start, stop, or reverse any feed with this lever

Start, stop or reverse the bar with this lever.

**The Lambert Machine & Engineering Company
Cleveland, Ohio, U. S. A.**

P. & H. Drilling and Boring Machine

No. 12



1. Rapid traverse in each direction can readily be manipulated by slight adjustments on the hand wheel.

2. The spindle speeds are obtained by quick change gears and variable speed motor for either A. C. or D. C. current resulting in the following speed variations:

A. C. Current, 12 to 542 R. P. M.

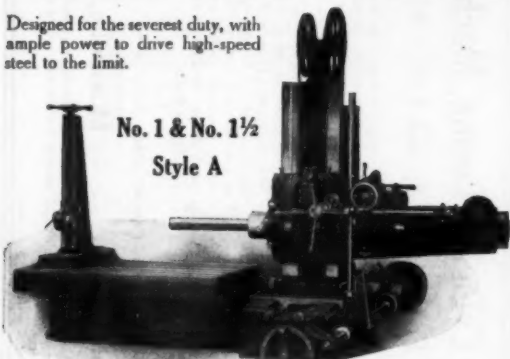
D. C. Current, 10 to 445 R. P. M.

3. The four changes of feed available for each speed are made by the operator without leaving his position near front end of spindle.

**Pawling & Harnischfeger Company
Milwaukee, Wisconsin**

G. & L. Horizontal Boring Drilling and Milling Machines

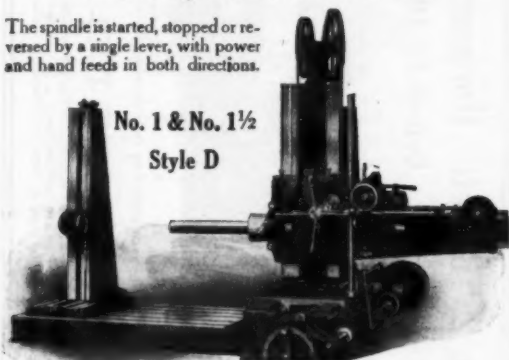
Designed for the severest duty, with ample power to drive high-speed steel to the limit.



**No. 1 & No. 1½
Style A**

Either Style with 3½" or 4" Bar

The spindle is started, stopped or reversed by a single lever, with power and hand feeds in both directions.



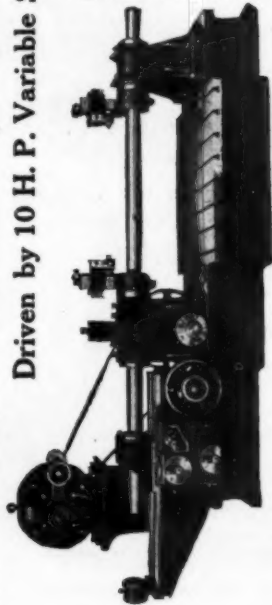
**No. 1 & No. 1½
Style D**

Write for Full Details and Catalog

Giddings & Lewis Mfg. Co., Fond du Lac, Wis.

No. 2 "Barrett" Horizontal Cylinder Boring Machine

Driven by 10 H. P. Variable Speed 4 to 1 Motor



A machine of great power, rigidity and convenience. It will bore out a cylinder 48 in. long at one setting.

The bed is 13 ft. 1 in. long—widened portion 48 in. wide by 56 in. long, and 18 in. high. The boring bar is 5 in. in diameter, with a continuous travel of 48 in. in either direction. Our patented quick change mechanism provides 10 different feeds.

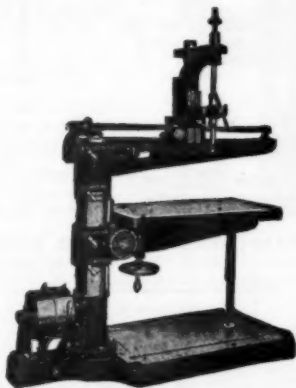
For more complete information as to its uses, design and construction, write to—

BARRETT MACHINE TOOL COMPANY, - - Meadville, Pa.

Builders of all sizes of Single and Double Bar Horizontal Cylinder Boring Machines for boring and facing simultaneously steam, gas, gasoline, pump and locomotive cylinders, also for boring the guides of engine frames and facing off end, besides boring and facing the crank shaft bearings simultaneously.

Manufacturers—Here it is

**The Most Economical Radial for
Drilling Small Holes in Large Work**



The greater capacity of the T. & F. Radial is due to the fact that the drills— $\frac{3}{4}$ -in and under—can be run at their most efficient cutting speed, while the machine is so much lighter and more sensitive that adjustments are made in less time. Pieces too large or too heavy for the ordinary sensitive, can readily be handled on the T. & F.

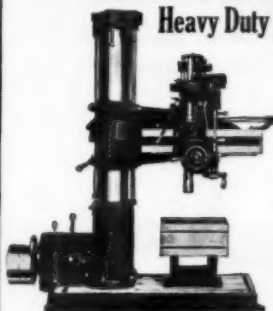
By combining heads of different types on our radial, such operations as drilling and tapping, or drilling and counter-boring are accomplished without losing time changing tools and speeds, as is the case with larger types of these machines. On many classes of work this fully equals the actual drilling time.

*Designed to save time and cost. Submit your
drilling problem for a frank and free discussion.*

The Taylor & Fenn Company
Hartford, Conn.

It will be worth your while to carefully consider these distinctive features of the

Heavy Duty Mueller Radial Drill



Patented Stationary Column.

Combination Positive and Friction Feed.

Effective, yet extremely simple control.

Combination Low and High speed reverse for backing out taps.

And many others which this space will not permit us to enumerate.

The Mueller Machine Tool Co.

Radial Drills and Lathes

Cincinnati, Ohio



High Grade Ball Bearing Drilling Machines

With 1, 2, 3 and 4 Spindles

Write for descriptive circular

Francis Reed Co.

43 Hammond St.

Worcester, Mass.

Hammond High-Speed Sensitive Radial Drills

Minutes—even seconds count when you are doing light drilling and tapping. If your mechanics spend their time moving heavy parts each time they drill or tap a hole, they are cutting your production and profits.

With a "Hammond" they move the tool from place to place instantly—anywhere within a 48" circle. They move the tool and not the work. The operator's time is spent in production—not in doing laborer's work at mechanic's wages.



*Write and find out how you
can cut your light drilling
and tapping costs 25 to 33%*

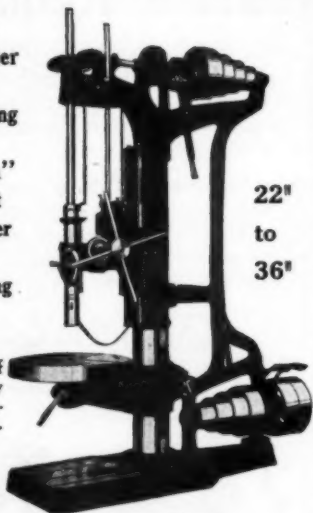
The Hammond Mfg. Co.
Cleveland, Ohio

The "Aurora" Has the Pull

The large
pulley diameter
and the
ratio of gearing
give
The "Aurora"
the greatest
pulling power
or
actual drilling
capacity

It has a foolproof
table and many
other special fea-
tures worth mon-
ey to you.

Write for Catalog

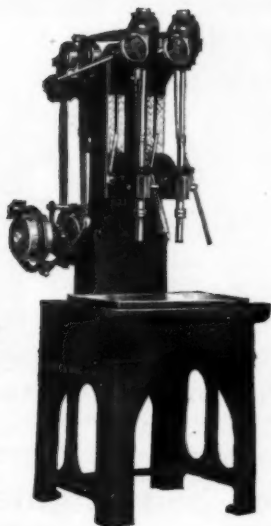


DRILLING TESTS OF 24" AND 26" DRILL

Size of Hole	Spindle Speed	Feed per Minute	MATERIAL
1"	360	9½"	Cast Iron
1"	360	6½"	Mild Steel
1½"	350	6½"	Mild Steel
1½"	350	9"	Cast Iron
1½"	225	5½"	Mild Steel
2"	225	6½"	Cast Iron

The Aurora Tool Works
Aurora, Indiana, U. S. A.

With
One
to
Eight
Spindles



For
 $\frac{3}{4}$ -in.
Drills
and
Smaller

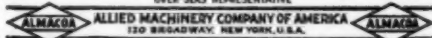
Henry & Wright Drilling Machines and our Chart of Feeds and Speeds

OUR CATALOG contains a chart showing a new standard of feeds and speeds for drilling, established after two years of exhaustive experiment. The results from its use are astonishing. Henry & Wright Drilling Machines, in connection with this new standard, to which they are particularly adapted, have fairly revolutionized sensitive drilling.

Better write for Catalog now, so you won't forget it

The Henry & Wright Mfg. Co.
780 Windsor St., Hartford, Conn.

OVER-SEAS REPRESENTATIVE



Principal Foreign Offices: Paris, Turin, Zurich, Barcelona

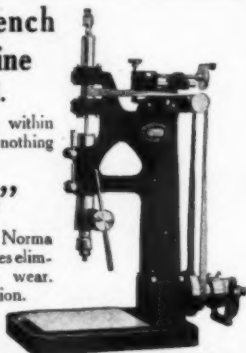
An Unusual Bench Drilling Machine 12,000 R. P. M.

For fast, low-cost drilling within its capacity you can find nothing better than—

The "Demco"

Equipped throughout with Norma ball bearings. Special features eliminate vibration and save wear. Write for complete description.

Also made in floor type, with one to four spindles



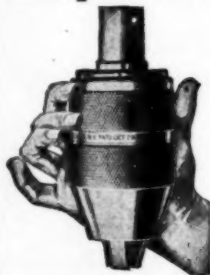
The Demco Machine Tool Co.

Successors to The DeMooy Machine Co.

706 Frankfort St., N. W.

Cleveland, Ohio

Eclipse Self-Tightening Drill Chuck



Roller bearing.

Quickest and easiest grip, and it never slips.

Self-tightening. No keys or wrenches.

It has no rival in its combination of quick and firm gripping, easy release, simplicity and accuracy.

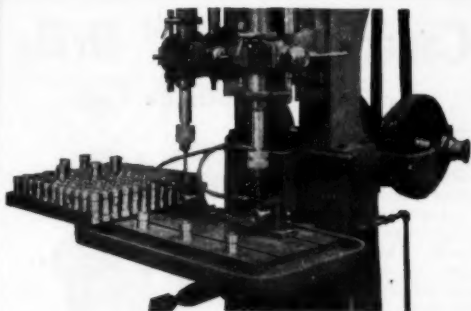
Saves time and money on high speed drills.

You need it now. Why wait?

Nielsen-Barton Chuck Co., 106 S. Jefferson St.
CHICAGO, ILL.

Also makers of ARBORS for all kinds of Chucks

YOUNG, CORLEY & DOLAN, Inc., 115 Broadway, NEW YORK CITY
New York District Agents



THE *Avey* AUTOMATIC

Operator Does Nothing But Load Jigs

Provides automatic approach and automatic return.

Depth gauge can be set for any desired depth of hole.

The instant the drill withdraws, the operator reloads.

The drill point is allowed to clear the work sufficiently to give operator just enough time to make the change. He operates as many spindles as the nature of work will allow.

THE MACHINE CROWDS THE OPERATOR. You can figure almost exactly what a day's output should be.

The Cincinnati Pulley Machinery Co.

Cincinnati, Ohio

Canedy-Otto 20" Drills

Are Up-to-the-Minute Tools

These new and improved 20-inch power drilling machines combine simplicity, speed and accuracy for drilling holes up to 1½ inch. They are rugged in construction, smooth and noiseless in operation, and have the graduated and automatic features found in high-priced tools. The gears are cut on automatic machines.

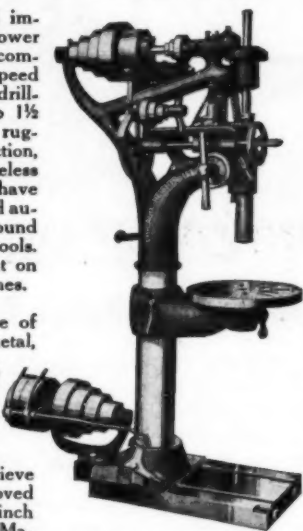
The bearings are of the best babbitt metal, with *Randall hydraulically pressed sheet graphite cones*, which increase their life 300 to 400%.

We do not believe the new and improved Canedy-Otto 20-inch Power Drilling Machines can be equalled—certainly not surpassed—in their output capacity for the investment. When desired, we equip them with motor all-spur-gear drive, also with new and improved tapping attachment.

*You will be pleased with both the quality and price
Glad to send you complete information upon request*

Canedy-Otto Mfg. Company
Chicago Heights, Ill.

Manufacturers of Forges, Blowers, Drills, Lathes and Grinders





FEATURES

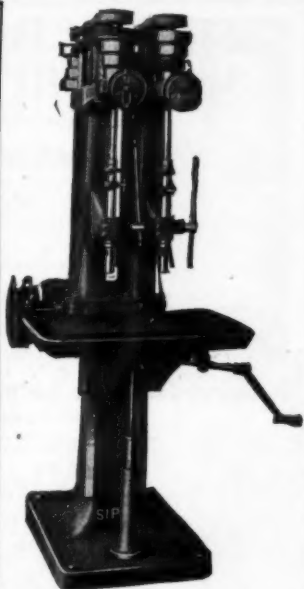
**Quick
Change Speed**
Change in 2 seconds

**Most
Efficient Drive**
No belt troubles

Safety First
All parts protected

**Heaviest
Drill Made**
Yet very sensitive

All Ball Bearings



The Only Way

to really understand the high efficiency of

The Sipp Quick-Change-Speed Drill

is to use one. Put one in now (you're bound to, sooner or later) then you will know why leading shops everywhere prefer THE SIPP.

Write for Bulletin No. 4

The Sipp Machine Co.

Keen St.,

Paterson, N. J.



"Buhr" Drill Heads

**Adjustable and Fixed Center
All-Ball-Bearing**

Adjustable from 2 to 12
spindles.

Fixed center, any number
of spindles.

We guarantee our Heads
to stand up to capacity.

Nelson-Blanck Mfg. Company
Detroit, Mich.

Adjustable Drill Heads



**Or Special Drill
Heads with Fixed
Spindles to fit your
work**

Life is too short to
drill one hole at a
time on any work
that you can do fas-
ter and cheaper with
Sellew Adjustable
or Special Heads.

*Let us help you
save some money*



SELLEW MACHINE TOOL CO.,

Pawtucket,
Rhode Island

Model "E-50" Sensitive Bench Drill Press

This 2-speed, direct motor drive, high-speed ball bearing drill is especially designed to care for all work, ranging from the smallest to a $\frac{1}{4}$ " hole.

Can be furnished with special pulleys to drive main spindle any speed up to 10,000 R. P. M.

Main spindle is heat treated and ground to size; it is guided through a quill with support at each end in an annular ball bearing.

End thrust is taken up by an end thrust ball bearing under feed arm.

A quick adjustable table has a working surface $5\frac{1}{2}$ " x 5", and will take work up to $4\frac{1}{2}$ " in height.

Surface of table is ground to insure accuracy.

Table has a self-cleaning taper, which keeps the precisely ground main column free from chips, and serves also as a guard to prevent injury to column.

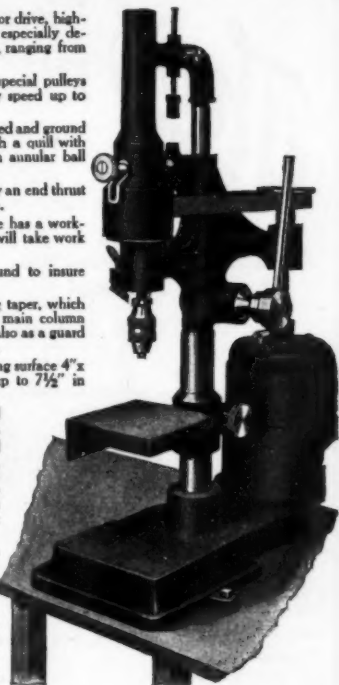
Base has a ground working surface 4" x 6", and will take work up to $7\frac{1}{2}$ " in height.

Base has oil groove and self-cleaning column support.

Your attention is called to another special feature, which is a spindle lock enabling quick changes of drills without the operator's hands coming in contact with belt or pulleys.

An idler pulley takes up any belt stretch which may occur in the endless woven canvas belt, without impairing sensitiveness of machine.

Front pulley and upper part of spindle are guarded by a semi-tubular guard insuring safety. Machine may be operated either by hand or foot control.



Height over all.....24"
Base..... $7\frac{1}{2}$ " x 18"
Diameter of spindle..... $7/16$ "

Spindle feed..... $2\frac{1}{4}$ "
Weight.....62 lbs.
Will drill to center of a 6" circle.

The High Speed Hammer Co., Inc.
Dept. 14
Rochester, N. Y.

Thor Universal Electric Drills

Licensed Under Burke Universal Motor Patent

**Attach To Nearest
Lamp Socket**

Used for all kinds
of Drilling, Reaming
and Wood Boring
in the building of
Automobiles, Steel
and Wood Cars,
Boilers, Auto Bod-
ies, and in Rail-
road and Structural
Shops, Ship and
Dry Dock Work
and for Machinery
Repairs.

Also equipped
with motor wound
exclusively for

Direct Current

No. 00

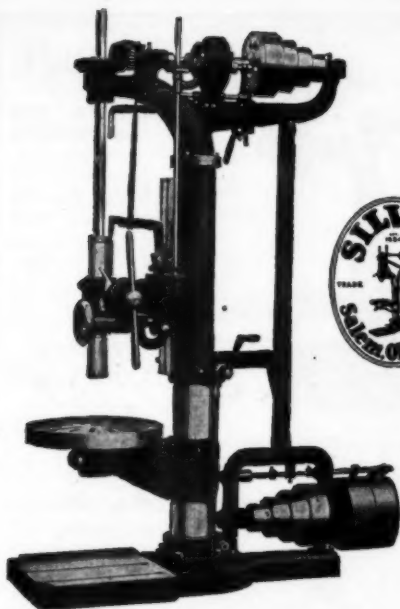
5/16 Inch
Drilling Capacity



*Jacobs Chucks furnished as
regular equipment.*

**Independent Pneumatic
Tool Company**

Chicago New York Pittsburgh Cleveland
Detroit San Francisco Birmingham Montreal



Silver's Time-Tested Drills

Standard for Over a Half Century

The cut shows our 25" Upright Drilling Machine, a sturdy tool that is built for the most generous output. It has the reliability that comes from long experience, with every practical improvement suggested by a constant study of modern shop requirements. We also make 20" Power Drills of "Silver" quality.

Complete information upon request—20" or 25" or both

PROMPT DELIVERIES

The Silver Mfg. Co. 295 Broadway, Salem, Ohio



Burke Quality

Excels on Fine Points

Machines of Burke Quality are never built with any name cast on the frame but our own—

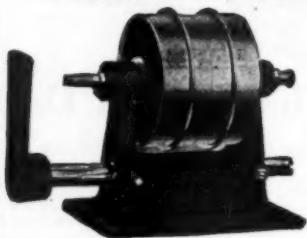
**BURKE
CONNEAUT
U. S. A.**

For Sale Everywhere

Price, \$20.

Burke Tapping Machine

Another Tool of Burke Quality



Pin Clutch Drive
 $\frac{1}{4}$ " capacity, \$20.

Friction Drive
 $\frac{3}{16}$ " capacity, \$20.
 $\frac{3}{8}$ " " 35.
 $\frac{7}{8}$ " " 50.

BUILT throughout with exceptional care, our several sizes give service in proportion. Accurate, rapid and convenient, they give solid satisfaction.

Send for details today

The Burke Machine Tool Co., Conneaut, Ohio

Ball Bearings Throughout

—with other improved features
make the Edlund sensitive drilling
machine a favorite in many shops

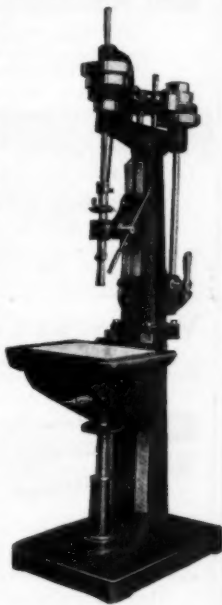
This modern machine contains a number of valuable improvements and conveniences not found in other machines of this type. With ball bearings throughout—ten b. bs. are used for every spindle—friction and vibration are cut down to the vanishing point, while speed and accuracy are increased in proportion. The

Straight Endless Belt

eliminates entirely the objectionable features of the quarter turn belt. The feed pinion bearing is extra long, and the sliding arm is extra large, having 9-inch bearing surface on the column. The splash system of lubricating is used.

There are four spindle speeds of 510, 816, 1273 and 2038 r. p. m. with drive pulley running at 500.

The frame is of heavy, one-piece construction, with extra large base.



*The complete story is told in our circular
Send for a copy—you'll be glad you did*

Edlund Machinery Company, Inc.
260-300 Huntington Ave., Cortland, N. Y., U. S. A.

Kelly PRODUCTION Tools



**"XX Type C" Head
For Boring Bars**

**C
O
U
N
T
E
R

B
O
R
E
S**



ADJUSTABLE
AND
REPLACEABLE
HEAD TYPES
SPRINT-BLACK

HARDENED
AND GRINDING
REPLACEABLE
GUIDE
BORING



Rigid Type Tools

Adjustable—Replaceable Blades

Send for our Catalog J-5

THE KELLY REAMER CO., Cleveland, O.

Waterston Combination Drill and Micrometer Boring Head



**Saves time,
material
and mistakes**

Unequalled for use on milling or horizontal boring machines for jig and fixture or experimental work. With even ordinary care it eliminates all possibility of expensive mistakes.

The Head runs concentric, and there are no projections to prevent reaching small places. When boring holes $4\frac{1}{2}$ " or over, the boring cutter is placed close up against the Head, making it very rigid, allowing the Head to pass through the hole.

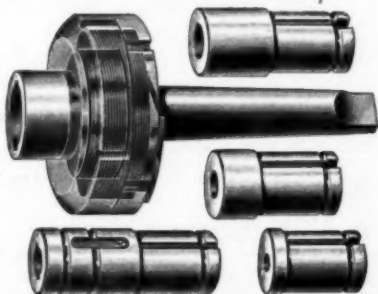
Write for description; you'll find it worth while

J. M. WATERSTON,

**78 Woodward Ave.
DETROIT, MICH.**

Nothing To Break—

Or get out of order with the
Safety Drill and Tap Holder



Made in Four Sizes, Covering 0 to 2½ in. Diameter

It saves money, time, labor and tools, and is the only device for the purpose which has given universal satisfaction.

You will find it simple, efficient, rapid and accurate. It permits tapping to the bottom. Prevents tap breakage, because it is friction driven, which causes spindle to revolve in case of any undue strain.

The change from drill to tap, and vice versa, is made without stopping the spindle. All "lost motion" is practically eliminated.

*Do not miss this worth-while economy
Glad to send prices and answer questions*

The Beaman & Smith Co.
Providence, Rhode Island



The Mandrel That Saves High-Pay Time

A set of NICHOLSON EXPANDING MANDRELS will do more and better work than all your old solid ones. You can save the time your men now waste "knocking down" and searching for different mandrels for different jobs.

Nicholson Expanding Mandrels

will fit any size hole—round or square—from $\frac{1}{2}$ " to 7" and do it instantly. Learn what a saving NICHOLSONS will mean to you. Sent on 30 day trial to prove their value. Write to-day.

W. H. Nicholson & Company
117 Oregon St., WILKES-BARRE, PA.



About Half The Time

Usually less, is required for all kinds of threading operations, when you replace solid taps and dies with

The Murchey Collapsing Taps and Self-Opening Dies

They are guaranteed to produce more accurate work, to produce it much more rapidly, and to save a big part of the cost. No matter what your threading work is, or how you are doing it, the chances are we can effect an economy that you will find worth while.

It will cost nothing to find out. Write us.

Murchey Machine & Tool Co., 58 Porter Street
Detroit, Mich.



McCrosky Super Reamers

**FIRST
RATE**—

said the "Super" in the Locomotive Stoker Company's plant at Pittsburgh, Pa. We've been using "McCrosky" Super Reamers for a LONG TIME—in fact, all our Reamers are McCrosky.

One of our 4" Reamers removes .0050" stock from a 3½" deep hole in malleable iron. It does this at least 200 times between grindings, proving beyond question that "McCrosky Cost Cutting Tools" means just what it says.

*Read all about Super Reamers in
McCrosky Efficiency Book No. 6*

McCrosky Tool Corporation
Meadville, Pa., U. S. A.

Detroit: Kresge Bldg., C. M. Sutton, Manager
Export Manager, B. Whittaker, 21 State St., New York

Finished Holes The Size You Want

Adjusts to Odd Sizes in .00025"



Madison Adjustable Boring Cutters and Bars

BETTER THAN REAMERS on automatic machines, turret lathes, boring mills, etc. The adjustments are fine, simple, positive and quick. For instance, a $3\frac{3}{4}$ " cutter is set to ream a 3.756" hole in less than two minutes. Made of high speed steel. Used by U. S. Government and large motor concerns.

Write for description and price list

MADISON MANUFACTURING CO., - Muskegon, Mich.

Tool Agents Wanted.

The Alert Boring And Facing Tool



Made in three sizes of the toughest material and specially heat treated, with high speed steel blades. For use on turret lathes, automatic screw machines and drill presses, for facing, counterboring and radiusing where a fine finish is desired, and for boring large holes where the cost of high-speed drills is prohibitive.

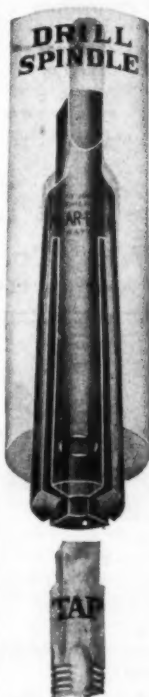
Also Ratchet Tap Wrenches, Roller Grip Arbors and Roller Grip Mandrels—all patented; High-Speed Solid Tap Wrenches and Hand Knurling Tool Holders.

Write for descriptive circular "H"

**Alert Tool Co., 237 N. 6th St.
Philadelphia, Pa.**

Every User is a Booster

For "Wear-Ever" Tap Chucks



You Will Be When You Try Them

When you find how easy it is to tap with them, how much time you save now spent in adjustments, how true they run regardless of any size variation, and how long they last, you cannot help becoming as enthusiastic over their convenience and economy as thousands of others.

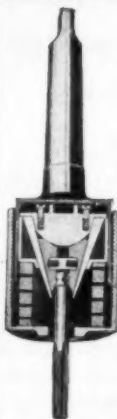
As when you do find out how good the "Wear-Ever" is you will be mighty glad to know, why not send in your trial order now? A tap chuck that costs less, does better work and lasts longer, is surely the thing for you. The "Wear-Ever" is made in one piece, is carefully hardened and can be depended upon in every way; it won't break, it won't slip, it won't fail in any respect.

Write for it now

Scully-Jones & Company

Suite 555 Railway Exchange Bldg.,

Chicago, Ill.



For Safe Tapping The Woodstock Chuck

It has the positive drive required in tapping tough metals, while it releases instantly when the tap reaches a point, as in bottoming, where to drive it further means to break it. The delicacy and absolute reliability of this Chuck eliminates all tap breakage, doing away with the annoyance, delay and expense of broken taps. It pays in taps, in time, and in satisfaction.

Five Sizes

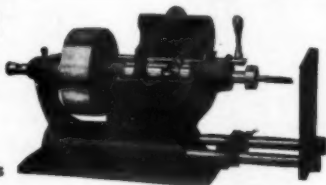
Let us send you one for trial

Peter Bros. Mfg. Co.

115 Railroad St., Algonquin, Ill.

Workwell Tapping Machine

Built for Service
Has Many Fine Points



2 bar slide to hold work straight with tap.

Steel gears 2" diameter, enclosed and running in oil.

Extra large hardened clutch. One loose pulley with hardened clutch. Non-slip tap holders. Die holder for threading outside threads. Stop adjustment for any depth of thread.

MADE IN TWO SIZES.

Type B 2 for threads to $\frac{1}{4}$ " diameter Type C 2 for threads to $\frac{1}{2}$ " diameter

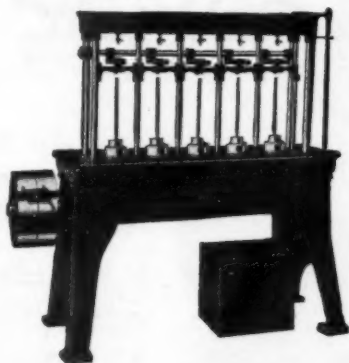
Give it a trial. Manufactured by

Workwell Engineering & Mfg. Co.

Dept. 2

616-620 W. Monroe St., Chicago, Ill.

Five Spindle Vertical Nut Tapping Machine



If we simply stated that the capacity of this machine was 20,000 $\frac{3}{8}$ " hot pressed square nuts per day, you would probably be a bit skeptical of our claims, but some of our customers are even exceeding this output on this size nut—we have prima-facie evidence, and we believe that this is considerably better than any other hand operated machine is turning out.

Taps are held upright, eliminating chips dropping into nut holders and consequent loss of time in frequently cleaning these out.

May we send descriptive matter?

The Webster & Perks Tool Co.

Box 1340, Springfield, Ohio, U. S. A.

“Van Dorn”
ELECTRIC TOOLS

**Will Help You
to “Serve and
Conserve”**



For years “Van Dorn” Portable Electric Drills and Grinders have been serving and conserving for alert manufacturers.

In these days of labor shortages, high costs and unparalleled demand “Van Dorn” Tools play a greater role than ever in saving time, money and labor and “speeding up the work.”

“Van Dorn” Tools can help you to do your bit better and quicker.

Write for Catalogs

The *Van Dorn* Electric Tool Co.
Cleveland, O.

Sales Offices in all leading cities

***"Sharp Tools
Defeat Sharp
Competition"***



New No. 190
"WELLS"
GRINDER

will do everything that
many more expensive
machines will do.

See it on your dealer's
floor or write for Ma-
chine Tool Cata-
log No. 39.

Machine Tool Division



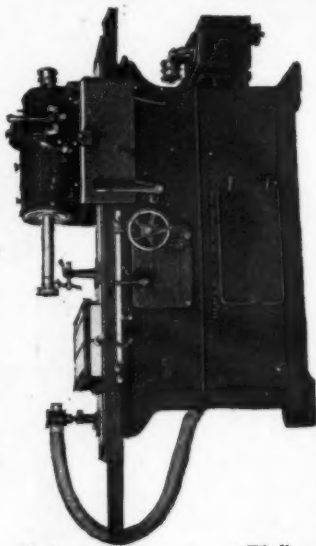
GREENFIELD TAP & DIE
Greenfield, CORPORATION Mass.

Accuracy and Precision

are followed out to the last detail in the construction and testing of the

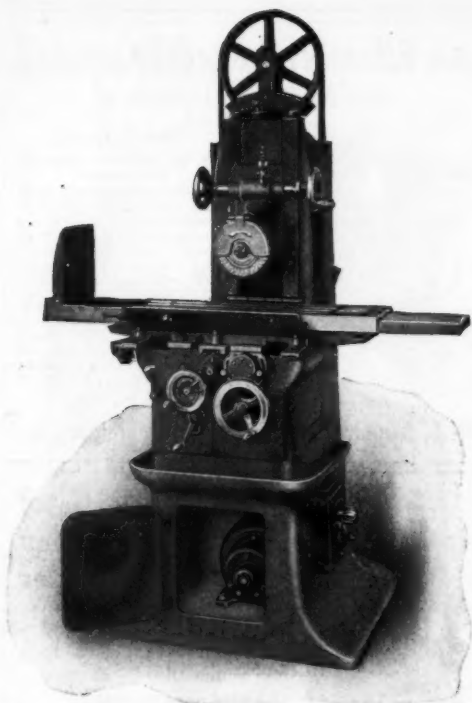
Whitney Cylinder Grinder

equipped for grinding all kinds of Gasoline Engine Cylinders.



Write for new catalog

BAXTER D. WHITNEY & SON, Inc., Winchendon, Mass, U. S. A.



The Abrasive Surface Grinder

50 Per Cent Heavier Than Others of Its Type

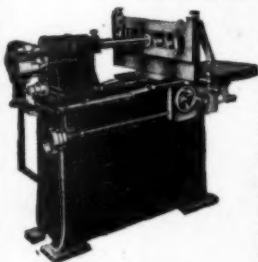
The first big step made in years to modernize tool room surface grinding. The "Abrasive" is solid, safe, convenient, and a big producer. May we send specifications?

Abrasive Machine Tool Co.

East Providence, R. I.

An Effective Internal Grinder

For All Engine Cylinders

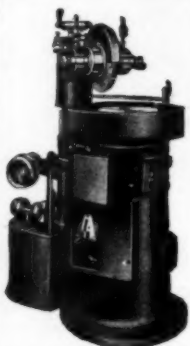


The Schmidt Is Accurate, Simple Compact

It will regrind tractor, truck and automobile engine cylinders so that they are as accurate as new, and do it so rapidly and economically that it makes a highly profitable machine for any factory or shop. It has ball bearings at pulley end of emery wheel spindle and both ends of rocker arm pulley shaft, and is built throughout for hard service. We can make prompt delivery.

Let us send details and Efficiency Records

B. L. Schmidt Co., Dept. A 8, Davenport, Ia.



The 12" Bristol Precision Rotary Surface Grinder

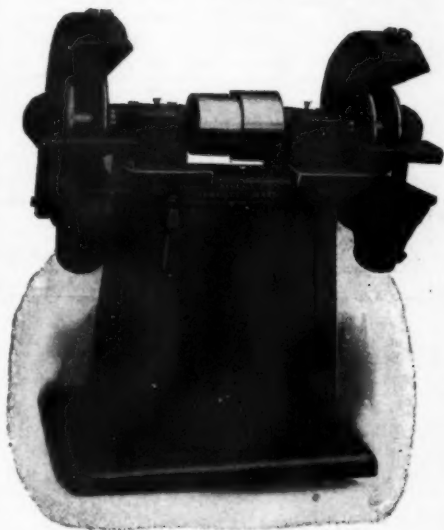
Grinds flat, convex and concave surfaces to within .00025" of manufacturing accuracy.

If it fits your work you'll be glad you found it. May we mail you the complete description?

Bristol Machine Tool Co., Bristol, Conn.

Successors to The C. G. Garrigus Machine Co.

Grind it on a "Blount"



No. 6½

Our eight sizes meet all requirements of general grinding work. The large bearings insure accurate work under continuous heavy load.

J. G. BLOUNT CO., Everett, Mass.



Cady of Canastota Hand Surface Grinder

An accurate machine of the greatest simplicity for the economical grinding of flat surfaces on punches, dies and other parts requiring a flat, true finish.

The platen has two movements—9" longitudinal by hand lever, and 6" traverse by hand wheel having graduations of .001". The 9" vertical adjustment is also graduated.

Large bearing surfaces on both movements, with gibs to take up wear. All sliding surfaces carefully scraped. Belt is kept at uniform tension by weighted idler.

Write for description and price of this economy Grinder

C. N. CADY CO., Inc., Canastota. N. Y.

Ott Grinders

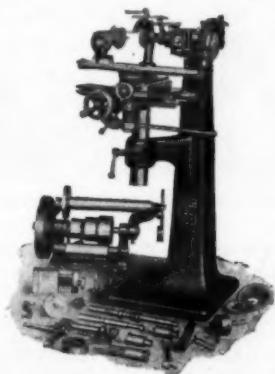
Combine the essentials of
ACCURACY and RIGIDITY
with **SIMPLICITY** of design

Simplicity accounts for their price, and for
their popularity among good operators.

5"x18" Plain—10"x32" Universal—6"x6" Internal

Ott Grinder Company
200 West Tenth St., Indianapolis, Ind.

**The Thompson makes it so easy
to keep your tools sharp**



Cylindrical, Surface and Internal Grinding

The simple, practical and thoroughly efficient attachments make it a highly desirable manufacturing machine for small parts which require accurate grinding.

It is a revelation for quick grinding of cutters and tools, making it easy for any ordinary help or even a boy to do expert work. No matter what the size of your shop, the economy will be noticeable.

Our Bulletin No. C 3 contains many excellent illustrations. Practical mechanics appreciate the hints submitted. Your request for a copy will have prompt attention.

The Thompson Grinder Co.
Springfield, Ohio



AN appreciation of its construction plus a knowledge of its past performance have created this unlimited confidence in the DUMORE Grinder.

Accuracy in grinding is possible only with a tool that is mechanically right. The DUMORE, with its dynamically balanced armature and speeds ranging from 10,000 to 50,000 R. P. M. positively insures perfect work, free from chatter-marks, taper or bell mouth. It is light and portable and is the ideal tool for grinding those "hard-to-get-at" jobs.

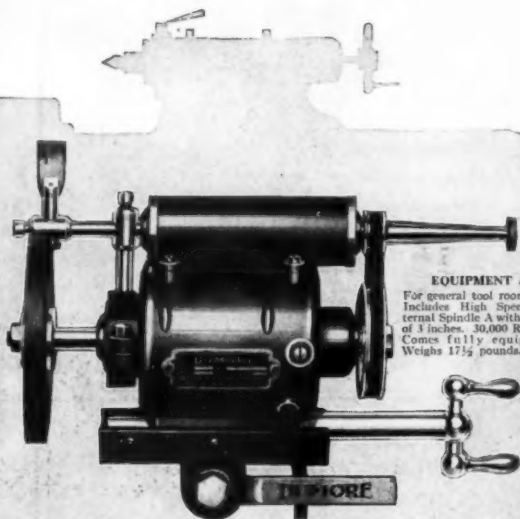
Vitally affecting the very volume of your production—in fact, back of the reputation of your manufactured products—is the quality of the tools you employ.

Is your tool-room equal to its task?

WISCONSIN ELECTRIC CO.
4314 Sixteenth St., RACINE, WIS.

DUMORE

"There's only one way under the sun for us to do this job right—that's with a DUMORE Grinder"



EQUIPMENT A

For general tool room use. Includes High Speed Internal Spindle A with reach of 3 inches. 30,000 R.P.M. Comes fully equipped. Weighs 17½ pounds.

HIGH SPEED GRINDERS

Grand Rapids No. 1

Universal Cutter, Reamer
and Tool Grinder



Simple in Design
Efficient in Service
Accurate in Workmanship
Economical in Cost

Ask for bulletin giving full particulars

Grand Rapids Grinding Machine Co.

17 Ottawa Ave., N. W.

Grand Rapids, Michigan, U. S. A.

The LaSalle No. 3 Plain and Surface Grinder

A Large, Accurate and Rigid Machine
For General Use in Shop and Tool Room



Grinding wheels.....	12"x1"
Between wheels.....	25"
Table working surface.....	7"x24"
Longitudinal movement.....	24"
Traverse movement.....	8"
Vertical travel.....	10"

No pains have been spared to make this splendid Grinder accurate, highly productive and mechanically perfect. The spindle is of steel, ground, and runs in bronze bearings. Each bearing has large oil reservoir and felt oilers. A vertical screw feed dial is graduated in thousandths, and smaller subdivisions may be readily obtained. The longitudinal movement, operated by spiral gear and rack, is perfectly smooth. All bearing surfaces are fully protected, and the ways are hand-scraped to master plates. Furnished with both plain and surface grinding wheels, or with the latter only, as desired.

A Grinder to bank on; want further details?

LA SALLE TOOL COMPANY

LaSalle, Ill., U. S. A.

Combines Speed and Precision High Grade Manhattan Grinder



We have put the best of everything into this tool—experience, labor and materials—and the result is *a revelation in quiet efficiency.*

The construction of spindle, with over-size phosphor bronze bearings, give big capacity for heavy cuts. Dials on both feeds are graduated to thousandths, of which fractions may be obtained for extreme accuracy.

Give us an opportunity of submitting the full interesting details

Manhattan Machine & Tool Works
Dept. A., Grand Rapids, Mich.

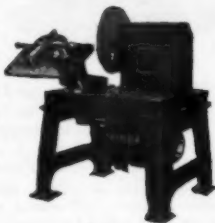
Fenn Portable Electric Grinder Especially Designed for Grinding Gear Cutters

Only 30 seconds required to changed from grinding a 40 pitch to a 5 pitch cutter.

May also be used on various formed milling cutters, and for other grinding jobs.

Self-contained motor and cord attached. Take it under your arm to any bench in the shop, and connect to 100 volt A. C. lamp socket.

*Low-priced and time-saving
Write for full description*



Fenn Manufacturing Company
Hartford, Conn.

W. A. FENN

W. L. FENN

Cable Address "Fenn"—Western Union Code



Premier Universal Tool and Cutter Grinder

With a swing of 8" and capacity of 15" between centers, together with the regular equipment furnished, it will grind almost any cutter or other tool used in a modern tool room. Workmanship, material and design of the highest quality.

*Write for descriptive
Circular*

Immediate Delivery

Simmons 10" Universal Index Centers



Manufactured with the idea of supplying the market with a device in which accuracy, durability and simplicity are the main issues and in which no one feature is sacrificed for another.

The price is the lowest consistent in keeping with the above standards. Our production is such that immediate delivery can be made.

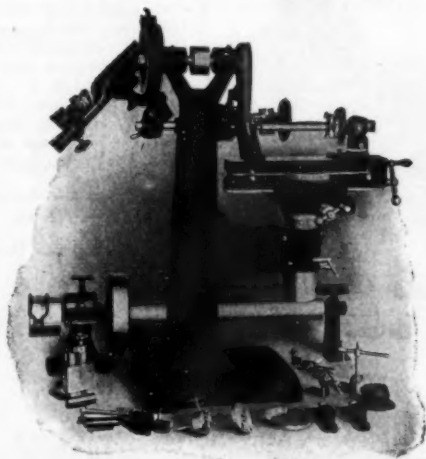
You need one? Order now!

Simmons Machine Co., Inc., Albany, N. Y.

New York, 1001 Singer Bldg. Detroit, 804 Dime Savings Bank Bldg.
Buffalo, 358 Ellicott Square

W & M No. "O"

Universal Cutter, Reamer and Drill Grinder



Longitudinal Movement.....	12 Inches
Vertical Movement.....	6 Inches
Transverse Movement.....	6 Inches

Centers swing work 8x17 inches

Circular on request

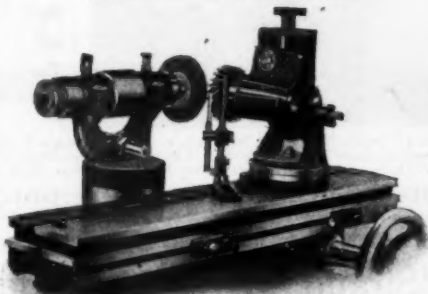
Wilmarth & Morman Co.

Master Grinder Makers

1185 Monroe Ave., N. W., Grand Rapids, Mich., U. S. A.

The *Greenfield*
Universal Grinding Machine

With Attachments for handling
every kind of grinding job



The Attachment shown above will hold any kind of shank, round or square, straight or taper. Quickly adjusted to any desired angle by means of the two swivels, both graduated for quick use.

While this Attachment is adapted to several uses, it is only one of many which we furnish with our Universal Grinder, and each Attachment is complete in itself.

*Write for complete description of this wonderfully
useful little Machine and its Attachments.*

Greenfield Machine Company
Greenfield, Mass., U. S. A.

Brush Finish to Auto Bodies



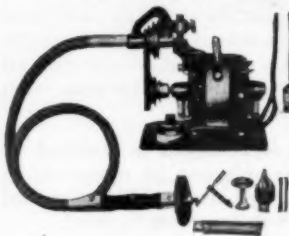
*Will
also
Grind
Ream
Drill
or
Tap*

Stow Flexible Shaft No. 4, with $\frac{1}{2}$ h. p. motor, driving a 6" wire brush on sheet aluminum body. A brush finish conditions the metal to take a good coat of paint. Over 200 outfits in use. Write us,

Stow Flexible Shaft Company
26th & Callowhill Sts., Philadelphia, Pa.

"Strand" Flexible Grinder

With an Unusually Efficient Shaft



The "Strand" Grinder is an efficient tool, and the flexible shaft is unusual.

Made with special machinery, it has all the strength of a rigid shaft, which has only to carry the load, and in addition it has the toughness and flexibility to carry the load when in a curved position.

The combination is an unusually dependable and efficient tool.

- Our several types and sizes are the result of 15 years' practical experience. Write for Circulars

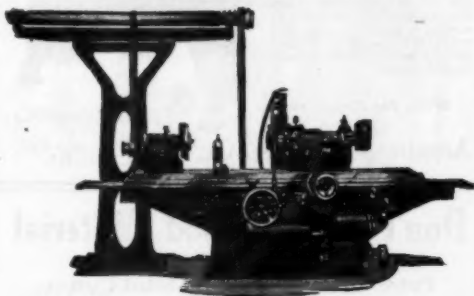
N. A. STRAND & CO., 625 W. Jackson Blvd.,
Dept. H, CHICAGO

Unequalled for Crankshaft Grinding

The

STERLING

Cylindrical Grinder



Built in sizes

18x50"

18x60"

18x72"

Equipped with

"Sterling"

Grinding

Wheels.

Equipped to rough and finish grind wrist pins and crankshaft bearings complete, no lathe work being necessary.

Write for descriptive circular

McDonough Manufacturing Company

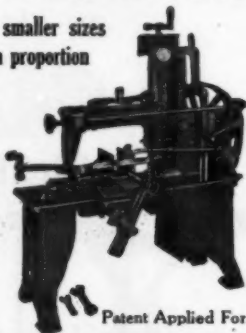
Eau Claire, Wisconsin, U. S. A.

Only 10 Minutes to Cut 6-in. Steel

**The Marvel No. 4 cuts smaller sizes
of cold rolled steel in proportion**

Cuts on the draw stroke and lifts free of the cut on the return. A graduated free wheel gives any desired pressure on the saw blade.

Machine stops automatically when piece is cut off, and can also be set to stop at any desired depth in the cut. It embodies speed, accuracy and expert workmanship. We also make other hack saws, punches and shears.



Write for Circulars

Patent Applied For

**Armstrong-Blum Mfg. Co., 314 N. Francisco Ave.
CHICAGO, ILL.**

Don't Waste Good Material

**You won't if you cut it with
Peter Bros. Abrasive Metal Cutter**

A rapidly revolving thin, abrasive wheel goes through high speed steel, in rods or bars, taps, reamers, copper, brass or aluminum tubing—anything difficult to cut or to cut smoothly—so easily and quickly that the economy and convenience of this method of metal cutting are everywhere recognized. If you are not using it, you have a mighty good thing coming to you.

8" Size \$17.50, with C. S.

Splendid for tool room. Cuts high-speed steel up to 1" square.

12" Size \$50, with C. S.

Cuts up to 2 1/2" diameter, round or square, at any angle up to 45 degrees. Ball bearing.

15 Days' Free Trial

Write us or ask your dealer

**PETER BROTHERS MFG. CO.
115 Railroad St., Algonquin, Ill.**



Peerless **HIGH SPEED**

**The Machine With
The Balanced Lift**



One of the Peerless improvements is the balanced lift, which automatically raises the blade for the return stroke. This economizes power and frees the teeth from strain and wear, greatly prolonging the life of blades and materially adding to the effectiveness of the machine.

The ability of the Peerless to do more cutting, at less expense for operation and upkeep, is what is bringing so many repeat orders for it, usually from manufacturers who are familiar with all the metal cutting saws in the market.

The records the Peerless has established and the preferences it has won, purely on its merits as a rapid and accurate metal cutting saw, make it the logical tool for you whenever you want more cutting capacity or more economical cutting.

Glad to send full details for immediate or future consideration

Peerless Machine Company
1609 Racine Street, RACINE, WISCONSIN

Not A Rotary Shear But a Simpler and Better Machine



It cuts sheet metal in the most intricate and difficult patterns without buckling the sheet or turning either edge. The sheet is left flat and straight, and both edges are smooth and square. It does not shear, it cuts; and as there is nothing to interfere with the free movement of the sheet in any direction, it is simple and easy to operate.

Capacities of Nos. 0, 1, 2 and 3 machines are:

18"	throat,	1/8"	plate
34"	"	3/16"	"
36"	"	3/8"	"
36"	"	5/8"	"

*What are your problems in
Sheet Metal Cutting?*

W. J. SAVAGE CO., Knoxville, Tenn.

More Cuts per Blade

When buying hack saw blades you are interested in the number of cuts you can get from each blade—you are interested in the cost per cut, not the cost per blade.

LIBERTY HACK SAW BLADES

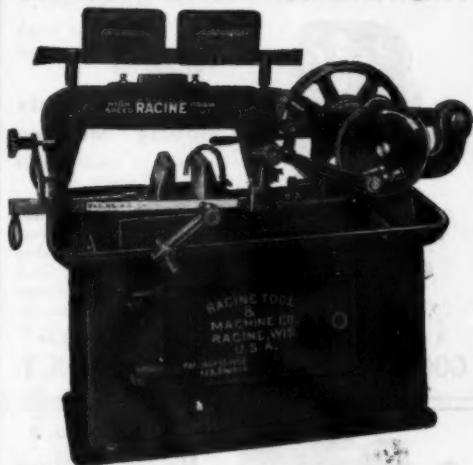
That is why Liberty hack saw blades are preferable—you get more cuts per blade—each cut costs you less.

Whatever your cutting problems are, Liberty hack saw blades are the solution. Made from the finest raw material and carefully constructed, each blade represents the greatest number of cuts obtainable.

Write for catalog and prices

Sterling Products Co., Inc.
549 Washington Blvd., Chicago, Ill.

Essential Economy



The "Racine"

High Speed Metal Cutting Machine

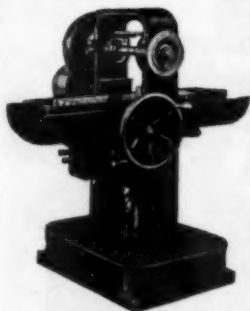
is in operation in all plants where economy of operation is carefully investigated.

It saves blades, saves material, saves time and labor. 30 different types.

Catalog "H" will be sent on request

Racine Tool & Machine Co.
Racine, Wisconsin, U. S. A.

Has Greater Driving Power



And to see it at work would soon convince you that the

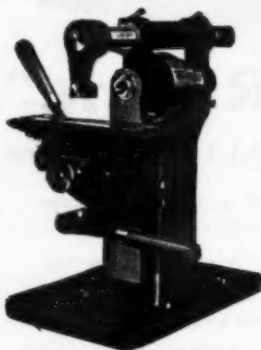
Briggs High Duty Milling Machine

excels in many other practical ways.

Designed along original lines by a manufacturing engineer, it easily makes better records in form and gang milling of steel parts for autos, guns, etc.

A successful time and money saving tool. Write us.

GOOLEY & EDLUND, Inc., Cortland, N. Y.



Burke's No. 3 Bench Millers

Are Seasoned Tools

Our system of tests insures accuracy, and our methods of construction make it permanent. Frames and parts are carried 6 to 8 months, after work begins on them, before the completed tools receive our final O. K., and all parts are finished and fitted with exceptional care.

Longitudinal feed, 6 in.; traverse feed, $3\frac{1}{2}$ in.; vertical motion of knee, $8\frac{1}{2}$ in.; table surface, $3\frac{1}{2} \times 12$ inch.

Write for Catalog, which also shows larger and smaller sizes.

The Burke Machine Tool Co.
Conneaut, Ohio

BECKER

The Machine that Gives the Smooth Finish



Model SD

Superiority of Ranges

is a salient feature that has earned a high place in the Machine Tool Industry for

Becker Belt Driven Millers

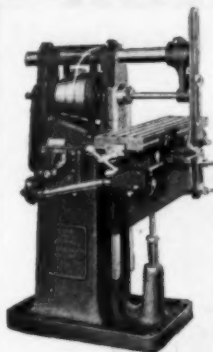
The Internal Belt Drive provides an elastic feed to the spindle, eliminating chatter and prolonging the life of the cutter used.

As a production tool The Becker is without an equal.

Circular S701 tells why. Write for it today

Becker Milling Machine Co.

Hyde Park, Boston, Mass.



2-B Plain Miller

An Unusual Machine

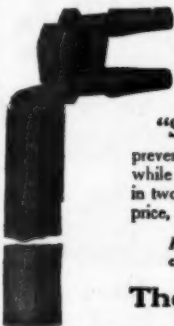
One of its unusual features is the Arbor Support, provided with a self-aligning ball bearing. The large double ball bearing will stand any cut for a long time without perceptible wear. As with this construction the arbor need not be hardened, there is no distortion of threads and no tendency of cutter to run out of true when nut is tightened. This insures long life without wear, prevents chatter, and insures great accuracy on parts requiring exact spacing and thickness.

Write for specifications, showing the unusual design in detail

THE DAVENPORT MFG. CO., Meadville, Pa.

Prevent Injury to Your Men

By Using "Safety First" Belt Sticks



It is now the "stick" in time that saves nine—accidents. Made with three rollers, two of them tapered, there's no chance whatever for the hook to get caught.

"Safety First" Belt Sticks

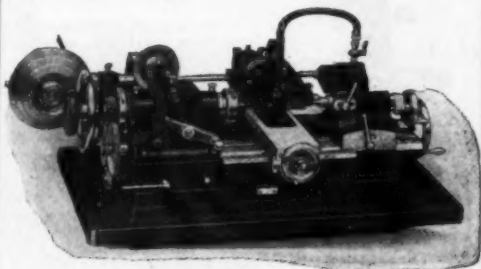
prevent your men—or women—getting hurt while putting belts on moving pulleys. Made in two sizes, 1 to 4 in. and 4 to 6 in., at one price, only \$1.25 each or \$12 a dozen.

Prevent that bad accident by ordering a few "Sticks" today

The Ready Tool Co.
Bridgeport, Conn.

Waltham Thread Miller

Universal or Manufacturing



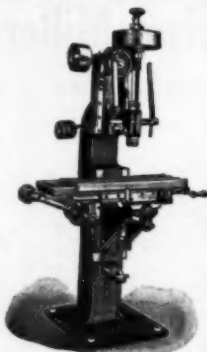
The complete machine, for universal use, includes many valuable features, such as a Compensating Bar, for varying the lead of thread, to make allowance for changing in hardening; a Taper Cutting Attachment; an Index of 12 divisions on work spindle, for obtaining multiple threads; a Horizontal Swivel to the cutter head, for milling square sided threads; Interchangeable Cone Pulleys for providing 16 work feeds, etc., etc.

When used as a single purpose machine the cost may be reduced by omitting some of the special features, and in manufacturing operations several machines may be cared for by one unskilled operator.

This machine is for bench use, but we also furnish a floor stand to which standard motors can be attached.

If you will send us samples of your work or drawings with dimensions, we shall be glad to suggest the best equipment, with production estimate.

Waltham Machine Works
Cutter & High Sts., Waltham, Mass.



The Clough No. 2 Vertical Miller With Slotting Attachment

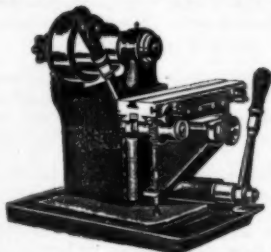
This is an especially practical machine, rapid and accurate, with a wide range of usefulness. It has 28"x9 $\frac{3}{4}$ " table, 21" lengthwise automatic feed, 9" cross motion and 15" vertical adjustment. It has six spindle speeds.

The Slotting Attachment is strongly bolted to the machine. It has a 12" slide and 4 $\frac{3}{8}$ " stroke. Can be tilted either side up to 5 degrees. The tool block can be swiveled around so as to cut cross or lengthways of the table.

This may just fit your requirements; write for complete data

R. M. CLOUGH, Meriden, Conn.

Just The Machine



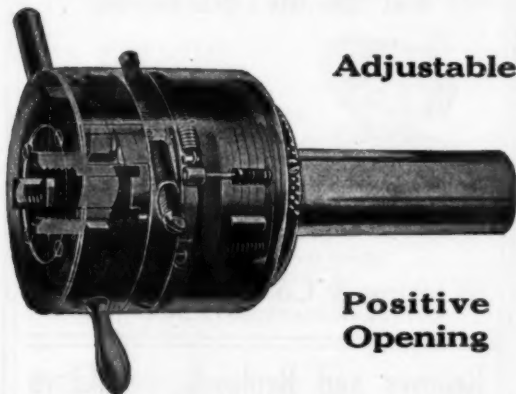
for those light cuts on details for Fire-arms, Sewing Machines, Typewriters, Bicycles, Electrical work, and a thousand and one other details used in the manufacture of the various products of the manufacturing world.

Send for descriptive circular

**The Carter & Hakes Machine Co.
West Winsted, Conn., U. S. A.**

AGENTS—for New England and New York, Hill, Clarke & Co.
WESTERN AGENTS—Marshall & Huschart Machinery Co.,
Chicago, St. Louis, Indianapolis.

Why Not Give This Automatic Die Head A Chance to Increase Your Production?



Adjustable

**Positive
Opening**

Some of the distinctive features:—

The Die Head is driven by three rollers, which are placed at the extreme outside of the shank head. This reduces all torsional strains on the Die Head to a minimum. The chasers run in hardened ways. The die is carried on two locking pins instead of the usual one, and positive opening mechanism prevents the chasers sticking.

You will find that the universal taper attachment cam, adjustable for any taper or length of thread, is particularly useful where a variety of threads is required. In short, the "Boehm" is the ripe product of long experience in the manufacture of all kinds of threading tools.

21 Sizes, from $\frac{3}{8}$ " to 9". What are your needs?

Rickert-Shafer Co., 1110 Cherry St., Erie, Pa.

You've Long Wanted This

A Dividing Head to Transform Your
Hand Miller into a Semi-Universal



YOU CAN USE these Centers for all kinds of straight milling, leaving your high priced machine open for more intricate work. By loosening the two binder bolts, Head may be turned right-angle to machine table, so that spindle of head and spindle of machine are parallel.

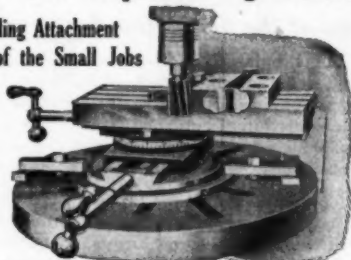
Glad to send you full description

Whiting & Comstock, 32 Union Place,
Hartford, Conn.
Export Department, 77 Broad St., New York City

Relieves and Replaces Big Millers

Davis Milling Attachment
Does 90% of the Small Jobs

Converts
any Drill
Press from
14 to 42-in.
swing in
2 Minutes



Relieves your large millers, comes in handy spotting castings, milling ends of bosses, etc., and does 90% of the lighter jobs as well as a \$1,000 machine; cuts keyseats perfectly. We also have low factory prices on our cylinder reamer for reboring the Ford car, and on our reliable air compressor. Write for details.

Hinckley Machine Works, HINCKLEY,
ILL.

A Time-Saving, Highly Efficient
Adjustable Hollow Mill



**Adjustable to the
1,000th of an Inch**

Only 14 sizes cover the entire range from $\frac{1}{4}$ " to 2", doing the work of hundreds of solid tools.

One set of blades outlasts three to five solid tools, and can be replaced at small cost.

Utilizes machines to their full capacity. Cuts 12" to 15" a minute in steel.

It never clogs up with chips and cannot change in size, as a solid tool will do after a few grindings.

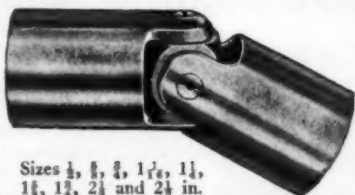
Saves time and money—increases output.

*Put your jobs up to our
engineers for rapid production*

Genesee Manufacturing Co., Inc.
Rochester, N. Y.

**Manufacturers of Adjustable Hollow Mills, Facing Tools, and
Inserted Tooth Face and Side Milling Cutters**

Self-Oiling, Dirt-Proof "Giant" Universal Joint for Heavy Duty



Efficient to an
angle of 45
Degrees

Vanderbeek
Universal
Ball Joints
for higher
angle drives

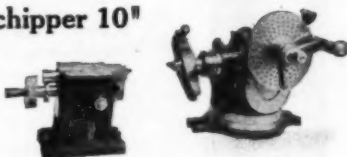
Sizes $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$, $1\frac{1}{4}$, $1\frac{1}{2}$,
 $1\frac{3}{4}$, $2\frac{1}{4}$ and $2\frac{1}{2}$ in.

Wearing contacts are of hardened steel, the stem ends are strong and well braced, and the whole design is so strong and carefully constructed that it will safely drive well over its rated capacity. *Glad to have you try it out.*

Ainslie Machine & Tool Works
Successors to Vanderbeek Tool Works
HARTFORD, CONN.

Universal Index Center

Schipper 10"



It is both light and strong, and handles a wide range of work. Swings to limit of $10\frac{1}{2}^\circ$. Index plates divide from 2 to 400 inclusive. Graduated head can be set from angle of 10 degrees below horizontal to 10 degrees beyond perpendicular. Rotates on base to any number of degrees desired.

Glad to mail you the complete description

Schipper Machine & Tool Co.
Aurora, Indiana

Cochrane-Bly Co. Circular Tables



12" Plain Table with Dividing Attachment



12" Plain Table and 10" Compound Table with Hand Feed

For use on Milling Machine, Slotter, Planer, Shaper, Drill Press and Boring Mill in the manufacture of Dies, Punches, Jigs, Fixtures, Gauges, Templates, Cams, Formed Cutters, and Miscellaneous Machine Work.

Circular and Prices on Request

Cochrane-Bly Company
Rochester, N. Y., U. S. A.

Supreme, Lasting Accuracy

**Dickow's
10-Inch
Universal
Index
Centers**



In combination with their great simplicity and ease of operation, help to increase production. Put us to the test.

Patents Pending



PROMPT DELIVERY

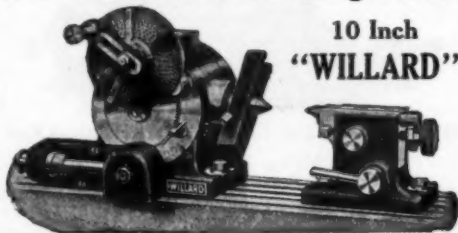
For Accuracy Get Dickow's

Sold by dealers. Write us today.

Fred. C. Dickow, 1858 W. Lake St., Chicago, Ill.

Full Universal Dividing Head

**10 Inch
"WILLARD"**



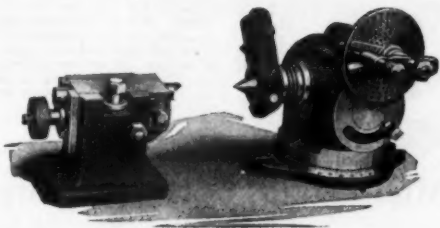
Right or left hand. Its exceedingly liberal proportions enable it to take care of the heaviest cuts on any plain milling machine. All parts interchangeable. Swivel head rotates from ten degrees below horizontal to ten degrees beyond vertical. Tailstock center can be set and securely clamped at any angle. An efficient locking device relieves the worm wheel and index pin of cutting strain. Wear between worm and wheel is taken up without disturbing their axial position. Driving mechanism for spiral cutting can be applied. One large index plate takes place of usual three, giving greater accuracy and more divisions.

Write for the complete description

THE WILLARD PRESS & TOOL CO., Cincinnati, Ohio

"Steptoe" Index Centers

Accurate—Rigid—Universal



"STEPTOE" Index Centers have an 8" swing for use on small and medium sized Milling Machines.

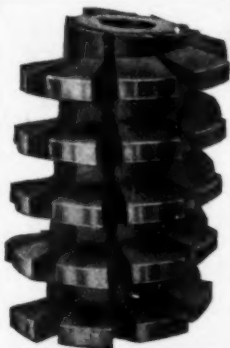
Immediate delivery

Write for prices

Also Manufacturers of "STEPTOE" Shapers and Milling Machines.

The John Steptoe Company

Cincinnati, Ohio



Form Milling Cutters Hobs and Special Tools

That are distinguished for
"Quality"

It doesn't show on the tools; it does show in the service and satisfaction you get out of them. If they work smoother and longer—as they will; if they turn out more and better work—as they will; if they prolong the life of your millers—as they will;—then are they not the tools for you?

*Try them
You will gain more than we*

Michigan Tool Company

Detroit, Mich., U. S. A.

Armstrong Drop Forged Wrenches

Superior Design and Quality



All
Kinds



All
Sizes

Catalog free



Armstrong Bros. Tool Co.

"The Tool Holder People"

308 N. Francisco Ave., Chicago, U. S. A.



***Yearly
Losses
in
Tools
Saved***

You can write indelibly on steel

even when hardened, just as easy as with
a pencil on paper, by means of

THE ELECTRO-STYLOGRAPH

Very useful for permanent marking of tools,
gages, dies, metallurgical test specimens, etc.

THE ELECTRO-STYLOGRAPH CO.

17 MADISON AVENUE,

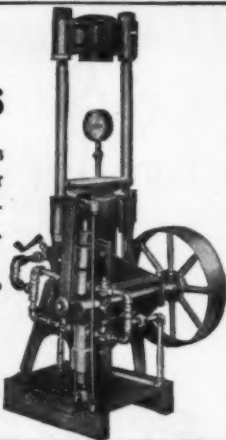
NEW YORK

Quick Acting Arbor Presses

This illustration shows a small, compact power press for broaching, forming, punching, forcing, etc.

If you have such work to do you should write for our CATALOG

Lourie Mfg. Co.
Springfield, Ill.



No. 24 Press

Efficient Equipment Atlas Presses

for building and repairing automobiles and general machine shop operations requiring pressure up to 25 tons and centering capacity up to 38 inches.

For driving mandrels; bending and straightening, broaching, embossing with dies, setting bushings and many other every day manufacturing jobs, there is an Atlas Press. All sizes for all purposes. It will pay you to investigate.

Atlas Press Co.
317 N. Park Street,
Kalamazoo, Mich., U. S. A.

Greenerd's Everywhere

The universal use of the Greenerd Arbor Press wherever in the world machine shop service is available goes to show how useful and profitable a tool it is. The demand for it has increased steadily from year to year, and now, despite the thousands sold and used, is at its maximum.

Because They Do Their Work

so well, so easily, with so marked an economy of time and labor, they have proved almost as valuable to the small shop, doing mostly repair work, as to the big manufacturing plant, in which they are simply indispensable. To pound an arbor out—or in—with a sledgehammer is to do it the hardest, the costliest way; to press it out—or in—with a Greenerd is to do it with the greatest possible saving of time, temper and cash.

*The Band Wagon is now moving;
won't you climb in?*

EDWIN E. BARTLETT
NASHUA, N. H.



It's Portable

The Barr Pneumatic Hammer

Is recognized today by progressive shop men as the ideal light power hammer!

A tool which should be in every up-to-date shop and tool room. A tool which repays its cost in short order and which you will truly appreciate every day you own it.

Expertly designed—exceptionally well built—simple—economical and dependable. Installed just where you want it, without expense of foundation, belts, shafting or motors.

Readily moved right to the job inside or outside.

Write for Bulletin 10H.



Fairbanks Hammers

25 to 300 lbs.

Belt or Motor Drive

**These Hammers Embody
a Design and Workman-
ship that are Unsurpassed.**

Send for Catalog

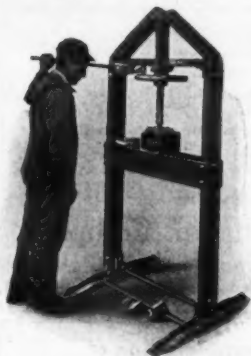
**United Hammer Co.
Oliver Building, Boston, Mass.**

SALES AGENTS

The Fairbanks Company—Albany, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Hartford, Newark, New Orleans, New York, Philadelphia, Pittsburgh, Providence, St. Louis, Syracuse, Havana, London, Glasgow, Paris.

WEAVER

20-Ton Press



A
Forcing Press
Operated by
Man Power
That Will
Meet Your
Demands Up
To 20-Tons
Pressure

One Man = 20-Tons Pressure With a Weaver 20-Ton Press

The WEAVER 20-TON PRESS, while designed particularly for the Garage, is meeting equally as large a demand from Machine Shops, Electric Shops and Factories, because of its extraordinary capacity and enormous power.

Construction:—

The frame is of ONE PIECE 5-inch, 9 pound channel steel, 32" wide between uprights, rigidly braced by a solid truss construction at the top, without bolted or riveted corners, or connections to weaken it. The screw does not revolve and is equipped with a "QUICK RELEASE" mechanism, that instantly releases the pressure when operated.

*For complete description write for Catalog
List price F. O. B. Springfield, Ill., \$85.00*

Special presses of extra width can be furnished at a nominal charge

Weaver Manufacturing Co.
2179 So. 9th Street, Springfield, Illinois

Case-Hardo

Effective But Not Poisonous

Works Quicker, Hardens Better, Costs Less

Successful use has demonstrated Case-Hardo to be the ideal case-hardening agent.

BECAUSE

It produces a glass-hard surface.

It gives a good color.

It penetrates deeply.

It requires less heat.

It hardens more work per pound.

If you want results, try Case-Hardo. You will get them with greater economy and more satisfaction than your experience has shown hitherto.

Made Only By

The Thos. Buchanan Company

29 W. 3rd St.,

Cincinnati, Ohio

Established in 1886

We have a complete line of

CASE HARDENING MATERIALS

"Hi Carbon" Pack Compound.

"B-G Compound" for Cyanide Hardening.

"Enamelite" for obtaining soft areas.

BOXES—POTS—OILS—BONE.

Shore's Scleroscope

In Stock

Prompt Service

Our complete catalog is waiting

Bell & Gossett Co.

613 W. 30th St.,

Chicago



A Deeper, Cleaner Case And it's Non-Poisonous

FERRO CASE "M" is for use in any style or make of cyanide furnace, and is handled in the same manner as cyanide. FERRO CASE "S" is for sprinkling on hot steel.

It gives a deeper, cleaner case, without the dangerous fumes which make cyanide objectionable.

FERRO CASE is a carefully prepared, uniform, non-poisonous compound, which does not lose its effectiveness with age or chemical action, and can therefore be stocked in quantity without danger of spoiling.

Since the Aircraft Production Bureau of the Government permitted us to pass FERRO CASE along for private use, we can now make delivery of either grade in any quantity. Be sure to specify which grade is wanted.

Write for details and prices

C. G. Buchanan Chemical Co.

Sta. H., Cincinnati, Ohio, U. S. A.

ELECTRIC EUCLID HOISTS

Let OUR Engineers Save YOUR Time

It is possible that you realize the need of modern material handling equipment but cannot spare the time or men to work out the details.

Our engineers are constantly solving these difficulties and helping manufacturers reduce expenses.

Furthermore, this service is absolutely free.

Will you take advantage of it?

The Euclid Crane & Hoist Co.

Dept. C

EUCLID, OHIO, U. S. A.

"The Handiest Tool in the Shop"

Canton Portable Crane and Hoist



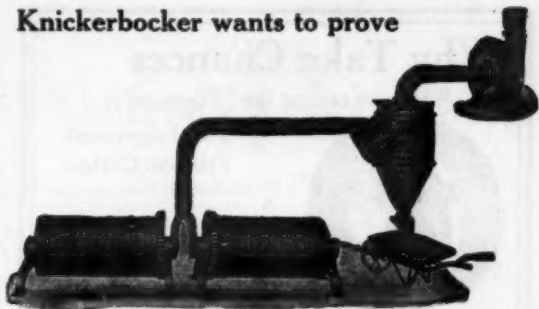
It is a costly proposition to call several men away from their work to do heavy lifting and lugging. When this is repeated very often, the loss runs into a good deal of money.

One man and "The Handiest Tool" easily do the lifting of six to ten men, and expedite the work by doing it so much faster, also with greater safety to the piece being handled. It is an economy which pays for itself many times over.

*Write for Booklet E-8
Describing several sizes*

CANTON FOUNDRY & MCHE. CO., Canton, O.

Knickerbocker wants to prove



"Rarefieds" are Superior Dust Collectors

Greater efficiency—After thoro investigation and trial, a number of the largest plants in the country installed from 5 to 20 "Rarefieds"—one is using 26 at present. A list of these users will be sent you on request.

Save power—They never fail to save power. One firm is now doing with 25 electric h. p. what formerly took 45 h. p.—a net saving in this instance of 20 h. p.

Reduce repairs—Abrasion of fan parts is prevented because the "Rarefied" collects and automatically discharges the dust before the air reaches the fan. Saves labor costs because there's no cleaning out by hand.



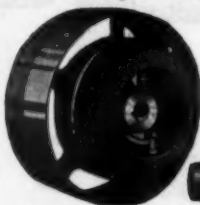
Our interesting Booklet gives full details as to "how" and "why."

Write for a copy

**The Knickerbocker Co.
Jackson, Mich.**

Why Take Chances

When you can get the "Edgemont"?



Enclosed Type, Self-Oiling

The Edgemont Friction Clutch

Has been used for so many years on so many different kinds of machines, and with such perfect satisfaction, that an "Edgemont" user knows he is taking no chances.

It stands the strain of use and abuse in heavy, rough work—of picking up heavy loads while being thrown in and out constantly. Pulls all the belt will, at any speed.

Write for Catalog, showing different types for all needs

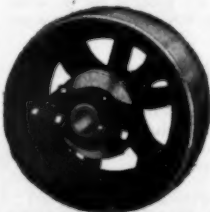
The Edgemont Machine Co.

Dayton, Ohio

Special Clutches and Transmission Machinery for all purposes.

Buy Clutches of Known Quality

Carroll Clutches are *good* Clutches



Self-oiling—double adjustment—double gripping power.

The steady usefulness of your machines depends on *good* clutches. Economy depends on *good* clutches. Take no chances with unknown quality: buy Carroll Clutches
—for their proved dependability.
—for their oft demonstrated economy.

Try one at our expense—you decide whether to keep it or not. Carroll Clutches are *good* clutches, that's why we make you this offer.

May we serve you?

L. W. Carroll Manufacturing Co.

Batavia, Ohio

Redface Pulleys



Sheaves and Fly Wheels



PERMANENT: They are permanent, as they are not affected by age, heat, cold or moisture.

RELIABLE: They do not loosen up under vibration or intermittent loading.

RUN TRUE: They run true, steady the line shaft, and have a very small load due to windage.

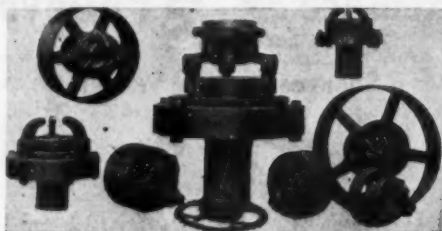
REDFACE PULLEYS are especially adapted to use on motors, fans, pumps and special machinery.

Catalog mailed promptly upon request

Pyott Foundry Co.

Cast Iron Pulleys, Sheaves and Fly Wheels
328 N. Sangamon St., Chicago, Ill.

**IF YOU DON'T SEE
YOUR NEEDS, WRITE US**



*Special Clutches—our specialty
Catalogue cheerfully sent on request.*

National Clutch Company
1859 Fulton St., Chicago, Ill.

Conway Friction Clutches

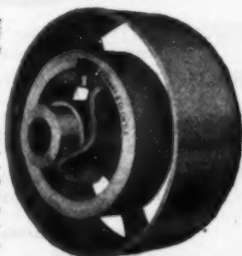
The Result of 20 Years' Improvement

Conway Friction Clutches are *right*. Send for long list of machines on which they are being used.

CMT Patent Clutch

is our Machine Tool Clutch, which is daily giving unsurpassed service on lathes, shapers, drills, millers, etc. It is composed of only three interchangeable members, and is unusually simple and durable.

Attractive prices for 10" CMT clutch pulleys for 1-7/16 shaft.



CMT Friction Clutch

Write for Catalog of the Friction Clutch that's RIGHT

CONWAY & COMPANY, Stock Yards P. O. Cincinnati, O.

JACOBS IMPROVED DRILL CHUCKS

How to select a drill chuck

You cannot go far wrong if you select the one of widest use, for it is sure to be thoroughly reliable and is more than likely to be the best.

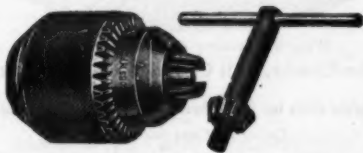
And the drill chuck of widest use is the "Jacobs Improved."

The reason is that it is also the drill chuck of the widest usefulness, insuring a maximum output with a minimum of drill breakage.

Not only can you count upon its thorough reliability, but your money can buy nothing better.

The Catalog explains

The Jacobs Mfg. Company
Hartford, Conn., U. S. A.



Every Lathe User

Should have a "Sweetland" Chuck Catalog



It illustrates lathe chucks for all purposes—the kind you can rely on. And the price list enables you to order without delay.

*Write for
Catalog 11-C*

The Hoggson & Pettis Mfg. Co.

New Haven, Conn., U. S. A.



We manufacture a great variety

Lathe Chucks, Drill Chucks, Centering Chucks

Also

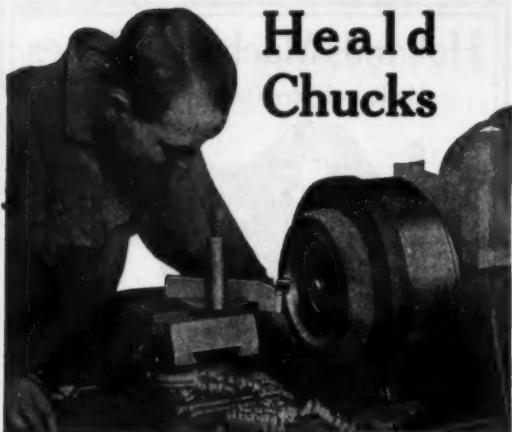
Portable Jaws for Lathe face plates and Machine tables.

Let us send you our Catalog

The Cushman Chuck Co.

Established 1862

Hartford, Conn.



Heald Chucks

Heald Chucks Applied to a Lathe

A most unique application of a Heald chuck was recently tried out on a lathe for holding fabroil gears.

The gear was centered by a plug in the chuck. Another pin which entered a hole in the web took the place of the tool and helped drive the work. The chucking time was reduced 20%. It proved so successful that there were 7 chucks ordered on its merits.

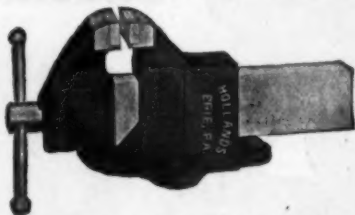
Write for Bulletins 371-372 and Series 300

THE HEALD
MACHINE & COMPANY
Worcester, Massachusetts

All Machine Dealers Will Supply Heald Chucks

Hollands Machinists' Vises

Made in Every Desirable Pattern

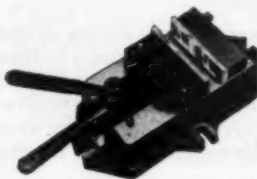


The high reputation of Hollands Vises is the result of over thirty years of satisfactory service.

HOLLANDS MFG. CO.,
Established 1887

Erie, Pa.

5-Inch Colt, Armory Model Quick-Acting Milling Vise



Developed and used during the war by a large manufacturer of fire-arms, who had to have something better than he could buy. Steel parts are drop forged, hardened and ground on fitting surfaces. Base is special iron. All parts are interchangeable.

Width of jaw..... 5 in.
Depth of jaw..... $1\frac{1}{4}$ "
Maximum opening..... $2\frac{3}{8}$ "
Weight..... 40 lbs.

This little tool is one of the good things developed by the necessities of war times, and we pass it along for your benefit. It was made to meet extreme demands and it stood the test.

Write for description of this unusual milling vise

The Hartford Special Machinery Co.
285 Homestead Ave.,
Hartford, Conn.

Chuck Instantly

The BARKER WRENCHLESS CHUCK is a vast *improvement* in general Shop Practice. It makes *instantaneous* an operation which has heretofore consumed valuable producing time.

The result: From 30% to 150% increase production for each lathe. Hundreds of the best known shops in the country attest this.

Simply pulling down the lever chucks the piece, whether the chuck is revolving or still—*accurately* self-centered.

The grip is unequalled. It is set at any desired pressure—at the touch of the operator.

Requires no other installations, permits bar work, readily attached to any lathe.

It is the *modern* method of chucking.

THOMAS ELEVATOR COMPANY

31 South
Hoyne Av.

Chuck
Division

Chicago
Illinois

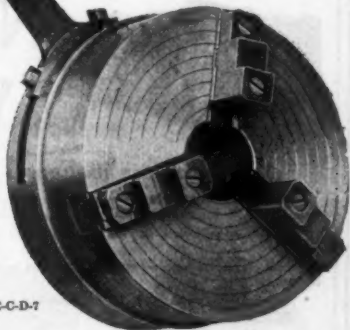
6" to 16".

Made with

2 and 3 jaws

Send for Booklet
"WRENCHLESS
CHUCKING"

T-E-C-D-7



The Barker Wrenchless Chuck

The Largest Range For Its Size

The "Supreme" Vise is Really Supreme



Patented Mar 5, 1919

Our literature describes ten superior features, all highly practical, which places the "Supreme" Vise in a class by itself.

Its range, simplicity, strength and reliability are supplemented with other features of vise convenience and utility which every vise user will appreciate.

Better write for the literature; you'll be glad you did

SPAFFORD TOOL WORKS, - Hartford, Conn.

Export Department, 77 Broad St., New York City



Nestor Vise

Here are its Features:

Work is gripped almost instantaneously—moves from maximum to minimum with quick action sliding jaw.

For size and weight an extraordinary gripping range is provided.

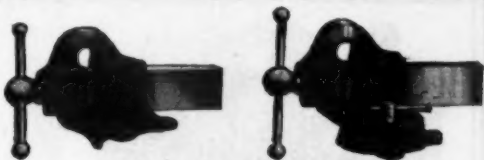
Hole can be drilled at right angles without taking work from vise.

Special provision makes it impossible for jaws to cock up. Immediate delivery.

Write for particulars, sizes and prices

Nestor Manufacturing Co., Inc.

40 W. 13th St., New York City



WHY YOST VISES?

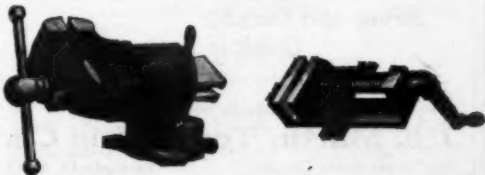
Because the best vise judges, the men who use vises in machine shops all over the world, have given them unqualified approval.

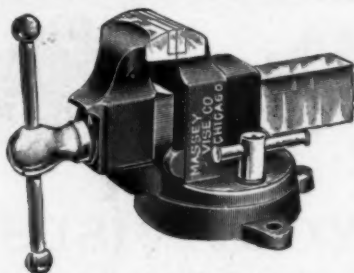
Because they are designed and proportioned to give the user the greatest possible convenience, combined with strength to withstand usual and unusual stresses, and a dependable reliability that is a guaranty of service.

Because they are manufactured in a thoroughly modern plant, with all needed facilities, and by men who are trained for this special work.

*Let us send our catalogue, and suggest
the best vise for your particular work*

Yost Manufacturing Co.
Meadville, Pa.





From the standpoint of durability, ease of operation and economy, Massey Vises have no superiors.

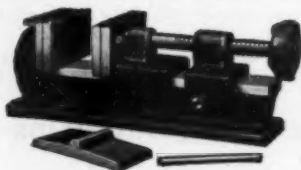
Write for Catalog No. 18.

Massey Vise Company

549 Washington Blvd.,

Chicago, Ill., U. S. A.

Gem Drill Vise



Strong and Durable

Quick in Action

Powerful Grip

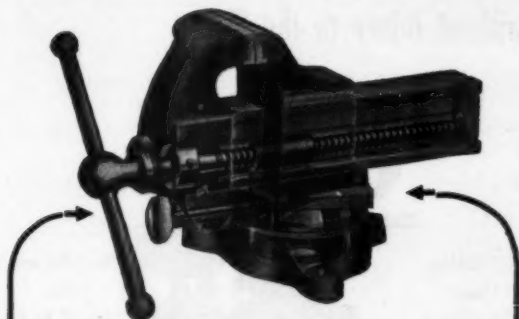
Made by

J. E. Martin Tool & Die Co.

548 West State Street,

Springfield, Ohio

Ask Your Foreman



Any Foreman will tell you that convenience of operation is a vital factor in realizing efficient production.

Lost motion—wasted effort—laborious methods—all drag heavily on the day's output. Working comfort is always essential to continued speed.

The Wedg-Lok Vise

is an easy answer to many machine shop problems. No matter what the article nor on how many sides it must be worked, it is easily handled in a Wedg-Lok Vise.

Quickly turned to any desired position without removing job from vise. Always accessible from any angle. No need to drop work and retard production.

Every part of the Wedg-Lok Vise is machined to close measurements. Will handle the most intricate of jobs with absolute accuracy. Impossible to vibrate or work loose. A slight turn of handle tightens the jaws and securely locks vise in base. A turn of the thumb screw locks it for permanent use in one position.

*Complete story, fully illustrated,
gladly mailed anywhere on request*

The Jahant Foundry & Heating Co.
208 Steiner Ave., Akron, Ohio

**This boiler flue cleaner works rapidly
without injury to the flues**



**Expense
Reducer**

**No. 1 Machine
Cleans
1½ to 3" Flues**

**No. 2 Machine
Cleans
3 to 6" Flues**

THE UNDERWOOD ROTARY does the cleaning in a scientific way, removing the hard, adhering crust of lime at the rate of 8 to 10 ft. a minute. Efficiency is increased by the arrangement of the tool steel cutters, which give a little in oval places or with uneven diameters.

You do not need a high priced mechanic to operate this machine. It reverses easily, is almost noiseless and makes but little dust. It's deservedly popular with railroad and shop men as a saver of time, labor and money. Our line of Portable Tools includes:—

Millers; circular planer tools; radius planers; rotary planers; machines for truing eccentrics, facing domes, arms for facing cylinder flanges; rotary flue cleaners; pipe benders; locomotive cylinder borers; boring bars for lathe work; crank pin turners; reflex water glass grinders; motors, etc.

Let us send you the interesting Catalog

H. B. Underwood Corporation

1015-25 Hamilton St., Philadelphia, Pa.

Second-Hand Machinery.

Lists of Second-Hand Machinery, either for sale or wanted, set in uniform style, will be published under this heading at the rate of **50 cents a line**, across the page, each issue. Minimum charge, **\$4.00**. Sub-headings are counted as one line, but the name and address of advertiser are not included in the space charged for. No display in this department.

Write directly to those offering the machines for sale for prices and full descriptions. If what you require is not listed, use the blank enclosed to make known your wants to the publisher.

WANTED BY

Signal Accessories Company, Inc.,

Utica, N. Y.

PILLAR PRESS.

We are in the market for a No. 7 or No. 12 Geared Straight Sided Pillar Press, made by the Waterbury Farrel Foundry & Machine Co. It may be a used or second-hand machine, but must be in good, first-class condition.

FOR SALE BY

The Sebastian Lathe Company,

Cincinnati, Ohio

Drill, 14" bench.....	\$ 50.
Lathe, 14"x8" LeBlond, plain change gear.....	300.
Lathe, 15"x8" Sebastian, 3-step cone.....	350.
Lathe, 15"x6" Sebastian, 3-step cone.....	300.
Radial, 4' Prentice, single pulley drive.....	1450.

FOR SALE BY

Brownell Machinery Co.,

11-13 Eddy St., Providence, R. I.

Drill, 34" Cincinnati-Bickford, radial	Grinder, No. 2 B. & S. universal.
Drills, 23" Prentice, b. g., p. l.	Grinder, No. 1 Landis universal.
Drills, 1-spindle Allen, b. b.	Grinder, 10"x72" Diamond disc.
Drills, 2-spindle Allen, b. b.	Lathe, 14"x6" Sidney, q. c. g.
Drills, 3-spindle Allen, b. b.	Lathe, 14"x6" Rockford, q. c. g.
Drills, 4-spindle Allen, b. b.	Lathe, 18"x8" Rockford, q. c. g.
Drills, 16" 1-spindle Barnes.	Lathe, 20"x14" Reed, q. c. g.
Gear cutter, No. 3-A Cincinnati.	Milling machine, No. 3 Cincinnati, plain.
Gear cutter, 48" No. 5 B. & S.	Milling mche., No. 1 Milwaukee, pl.
Gear cutter, No. 12 B. & S.	Milling machine, small Brown & Sharpe universal.
Grinder, No. 1 Landis universal.	

FOR SALE BY

Reliance Machinery Sales Co., 112 West Park Way, Pittsburgh, Pa.

Crane, No. 4 Canton, new.	Lathe, 22"x10" Davis, d. b. g., q. c. g.
Cut-off machine for tubing.	Lathe, 26"x10"x6" Walcott, d. b. g., q. c. g.
Drill press, 24" Rockford.	Libby lathes, 18", 22" and 26"
Grinder, No. 3 B. & S., univ. cutter & r.	Miller, No. 4 Garvin universal.
Grinder, Brandes tool, with motor.	Miller, 30"x30"x8" Newton horizontal & vertical.
Grinder, No. 1 W. & M. surface, new.	Motors, 1/2 h. p., d. c., with blowers, (3).
Grinders, Yankee drill, all sizes, new.	Radial drill, 6" post, 1/2" cap.
Lathe, 16"x6" LeBlond.	Shaper, 20" Smith & Mills.
Lathe, 16"x8" Hendey, q. c. g.	Turrets, 24" & 28" Steinhilber & Gisholt.
Lathe, 18"x8" Superior, d. b. g., q. c. g.	
Lathe, 20"x8" Lodge & S., grd. hd.	

Large stock of new and used Grinders, Drill Presses, Hack Saws, etc.

SECOND-HAND MACHINERY

FOR SALE BY

Niles-Bement-Pond Company,

111 Broadway, New York

Located at our various factories and stores.

LATHES.

12"x 5' Robbins, draw-in attach.
14"x 6' Bradford, c. r.
14"x 6' Whitcomb, taper, pan.
14"x 6' LeBlond, geared head.
14"x 8' Whitcomb, q. c.
15"x 7' P. & W. speed lathe.
16"x 6' Whitcomb, q. c.
16"x 6' Reed, r. & f. rest.
16"x 8' Bradford, c. r.
16"x 8' Von Wyck, quick change.
18"x 6' Prentice.

18"x 8' LeBlond, quick change.
18"x 10' Flather, c. r.
21"x 8' LeBlond, geared head, heavy duty.
21"x 8' Bradford, c. r.
21"x 10' Bradford, c. r.
22"x 8' Niles, c. r.
24"x 10' Whitcomb, q. c.
24"x 14' Pond, q. c. taper.
30"x 14' Niles, c. r.
30"x 18' Pond, quick change.

TURRET LATHES.

14" Fay auto lathe, j. l.
2"x 24" J. & L. cone head.
2"x 24" Warner & Swasey, hol. hex.
2"x 26" P. & W. turret lathe.
25" size J. Gisholt, 3 1/2" spindle.

24" size I Gisholt, 220 volt, moort drive, d. c.
28" Milwaukee rigid, 4 1/2" spindle.
34" size K Gisholt, 4 1/2" spindle.

SHAPERS AND PLANERS.

15" P. & J. univ. shaper.
16" Stockbridge shaper, p. d. f.
14"x 6' Niles sgl. trav. head shaper.
22"x 22" x 8' Cincinnati.
24"x 24" x 6' heavy Cincinnati.
26"x 26" x 6' Pond, 2 heads.
30"x 30" x 6' Pond, 2 heads.
30"x 30" x 8' Pond, 2 heads.
30"x 30" x 12' Pond, 2 heads, 220 v., d. c., reversing motor drive.

30"x 30" x 10' Pond, 2 heads.
32"x 32" x 6' Gray, 2 heads.
42"x 42" x 26" Pond, 4 hds., 220 v., d. c., reversing motor drive.
48"x 48" x 16" Pond, 3 heads.
72"x 60" x 10' Pond, 2 heads.
46"x 48" x 27" Pond, 4 hds., 220 v., d. c., reversing motor drive.
72"x 72" x 24" Pond, hvy. forge, 3 hds.
10"x 10" x 25" Pond, 220 v., d. c. motors.

MILLERS AND GEAR CUTTERS.

No. 1 Cincinnati univ. backgeared.
No. 1 Brown & S. plain.
No. 1 Cincinnati plain, cone type.
No. 2 Becker B. plain.
No. 2 Cincinnati plain, cone type.
No. 3 Brown & S. univ., old style.
No. 2 LeBlond plain, single pulley.
No. 3 LeBlond, universal, heavy, late type.
No. 3 plain Brown & Sharpe.

No. 4 univ. Brown & Sharpe.
No. 5 Becker B. vertical.
No. 2 Brown & Sharpe vertical.
No. 5 Brown & S. vert., old style.
No. 3 36"x 8" B. & S. gear cutter.
No. 4 36"x 9" B. & S. gear cutter.
No. 6 60"x 12" B. & S. gear cutter.
15" Gleason bevel gear generator.
24" Gleason bevel gear planer.
48" Gleason bevel gear planer.

DRILLING MACHINES.

No. 1 Putnam, gooseneck.
24" Aurora, sliding head.
24" Cincinnati Bickford, sliding hd.
26" B. F. Barnes, sliding head.
32" Aurora, sliding head.
32" Cincinnati Bickford, sgl. pulley.
60" Niles, heavy vertical.
3' Grant radial drill and boring mch.

4' Prentice speed box radial.
4' Niles semi-universal, old style.
5' Niles semi-universal, old style.
6' Niles semi-universal, old style.
6' Pond heavy plain radial, 220 v., motor drive, d. c.
2 spindle Allen 12" o. h.
3 spindle Allen 12" o. h.

GRINDERS.

No. 2 Brown & Sharpe surface.
No. 3 Rivett internal.
No. 11 Brown & Sharpe internal.
No. 1 Cincinnati cutter and reamer.
No. 3 B. & S. cutter and reamer.
4"x 30" No. 11 Brown & Sharpe pl.
5"x 32" No. 11 plain Landis.
10"x 30" No. 21 plain Landis.

8"x 48" No. 14 plain Landis.
12"x 44" No. 14 plain Modern.
12"x 30" No. 2 univ. Brown & Sharpe.
12"x 40" No. 2 univ. Brown & Sharpe.
12"x 60" No. 4 Landis universal.
20" wet tool.
36" wet tool.
39" grindstone frame, B. & S.

BORING MACHINES

No. 1 Barnes horizontal drill.
No. 1 Bement horiz. 24" spdl. 5' tbl.
No. 2 Bement horiz. 3 1/2" spdl. 6' tbl.

No. 3 Bement horiz. 4 1/2" spdl. 9' tbl.
30" Niles turret borer.
42" Niles boring and turning mill.

SECOND-HAND MACHINERY

Niles-Bement-Pond Company.—Continued.

MISCELLANEOUS.

Air compressor, type 10, Ingersoll-Rand, steam driven, capacity 535'.
 Air compressor, Ingersoll-Rand duplex, motor driven, with 35 h. p., d. c. motor, capacity 215'.
 Blower No. 10 Sturtevant.
 Blower, No. 70 Buffalo.
 Blue print mch., Wagenhorst, 60", vertical cylinder.
 Engine, 164 h. p. McEwen, direct connected to 100 k. w. generator, d. c. 220 v.
 Engine, 200 h. p. Brown, belted to 200 k. w. Westinghouse generator, d. c. 220 v.
 Hammer, 800 lb. steam, Bement.
 Keyseater, No. 2 Giant.
 Profiler No. 3 automatic, Keller.
 Saw, 8" rounds, Higley.
 Slotter, 6" Bement.

FOR SALE BY

X. Y. Z., Care A. H. Hitchcock, 1235 Caxton Bldg., Chicago, Ill.

LATHE PATTERNS, Etc.

Old established lathe company desires to dispose of its 9" lathe patterns, jigs, semi-finished parts, repair rights, etc. Address as above for full particulars.

FOR SALE BY

Herman L. Winterer,

943-53 N. Front St., Philadelphia, Pa.

LATHES.

39-48"x14' Box gap extension.	26"x12' Wickes, q. c. g. (2).
31"x14' Niles.	26"x10' Niles, quick change gear (2).
32"x12' Pittsburgh, q. c. g.	21"x10' Fitchburg.
25"x26' Johnson.	20"x16' Putnam.
26"x12' Bridgeford, quick change gear (2).	20"x8' 6" Walcott, d. b. g., q. c. g. (3).
	And many others.

TURRET LATHES.

22" Gisholt.	No. 4 Warner & Swasey, Fox attach.
3"x26" Jones & Lamson, (2).	No. 4 Warner & S. practically new.
7"x14" Potter & J. semi-auto., (2).	And many others.

DRILL PRESSES

6' Newton radial.	25" Weigel.
40" Barnes horizontal radials, (2).	20" Baker, (5).
36" Bickford radials, circular base, table, motor driven, (2).	Plain drills, all sizes.
36" Dreses radials, (3).	Drill presses, assorted sizes, (21).

MILLING MACHINES.

26"x8' Ingersoll horizontal.	No. 2A Kempsmith.
25"x6' Garvin No. 15 slab, q. c. g.	Newton universal, table 50"x8".
No. 6 Becker vertical.	Newton plain, table 42"x8".
No. 3H LeBlond univ., heavy duty.	No. 3 Garvin hand, horizontal.
No. 3 Hendey-Norton.	Whitney hand.
No. 3 Brown & Sharpe.	And many others.

MISCELLANEOUS.

Boring mill, 38" Beaman & Smith.	Grinder, tool room, Heald univ.
Boring mill, 34" Newton bar wheel.	Grinder, roll, 54"x10 1/2" Diamond.
Boring mill, 36" Bullard vertical.	Punch presses, all sizes.
Boring mill, 30" Bullard vertical.	Saws, 6" Newton, cold, (2).
Grinder, disc, No. 17 Besly.	

BOILERMAKERS' AND SHIP MACHINERY.

Flanging press, 100-150 ton capacity.
 Hammer, steam, Dudgeon, 1500 lbs. capacity.
 Punch, 43" gap Perkins, 1 1/2" in 1 1/2".
 Riveter, 8 1/2" Wood hydraulic.
 Shear, 24" Hans Kraut, beam, channel and angle, capacity 3"-24".
 Large assortment of General Machinery. Send for complete list.

SECOND-HAND MACHINERY

FOR SALE BY

Simmons Machine Co., Inc., Albany, N. Y.
1001 Singer Bldg., New York 358 Ellicott Square, Buffalo
804 Dime Savings Bank Bldg., Detroit

PLANERS.

66"x52"x13' 6" Reliabuilt, 2 heads.
14' Hilles-Jones plate planer.
82"x74"x52"x24' Betts, extens., 2 hds.
42"x42"x11' Putnam, 2 heads.
New 42"x42"x12' openside, 2 heads.
35"x38"x12' 6" Reliabuilt, 3 heads.
38"x38"x 8' 6" Reliabuilt, 2 heads.
36"x36"x18' Flather, 2 heads.
36"x36"x12' Rockford, 8 heads.
36"x36"x12' Bickett, 2 heads.
36"x36"x 8' Pond, 2 heads. ϕ
22"x22"x5 1/2' Wheeler, 1 head.

MILLING MACHINES.

No. 4 Brown-Sharpe universal.
No. 4 Cincinnati universal.
Becker-Brainard Lincoln, tbl. 9x29".
No. 2 Pratt-Whitney hand, with c. s.
Standard hand miller, with c. s.
New Bickford hand miller.
No. 3 Kempamith univ., vert. head.
No. 3-B Owen plain.
No. 2 Brown-Sharpe univ., vert. att.
No. 1 1/2 Garvin universal.
New No. 1 1/2 American plain.
New 10" Simmons universal index centers, with or without spiral cutting attachments.

GRINDERS.

No. 5 Brown-Sharpe universal.
10"x24" Landis plain.
New Dumore elect. tool-post, equip.
A, B, C.
No. 1 Landis universal.
No. 1 Landis internal.
8" Head ring and surface.
18" Reed surface, table 18"x8".
18" Gardner disc, with c. s.
No. 1 Brown-Sharpe universal.

DRILLING MACHINES.

8-spindle Baush, geared hd., belt dr.
3' Drees plain, extra plain box table.
3' 6" Bickford radial, back geared.
4' 6" Bickford radial, tapping attach.
5' Baush plain, complete.
6' Prentice radial, tapping attach.
6' Pond plain, arranged motor drive.
7' 3" Warren semi-universal radial.
22" Barnes, sliding hd., tapping att.
24" Aurora, sliding head.
26" Snyder upright, sliding head.
26" Rockford sliding head.
28" Garvin upright.
36" Snyder upright, sliding head.
38" New Haven, sliding head.
4-spindle Foote-Burt sensitive.

LATHES.

New 11"x 5' Myers.
13"x5' Champion.
14"x5' Putnam, stand. change gears.
New 14"x6' Monarch, complete.
16"x 6' Rahn-L., q. c. g., complete.
16"x 6' Lodge-Shipley, complete.
16"x 6' LeBlond, c. r., p. c. f., comp.
New 16"x 8' Monarch, with oil pan, pump, and piping.
18"x 6' American.
18"x 8' Reed, taper attachment.
18"x 8' Gray.
18"x 8' Greaves-Ktusman, taper att.
20"x 8' American heavy duty.
21" LeBlond, all-gear head.
24"x10' Flather.
33"x 8' 6" Fifeild chucking lathe.
38"x14' Pond complete.
40"x18', 24', 36' Fifeild, triple grd.
New 60"x25' Simmons, triple geared.

BORING MILLS.

10' Niles vertical.
34" King vertical, swing 36".
36" Bullard vertical.
42" Gisholt vertical, late type.
No. 31 Lucas horizontal.
No. 32 Lucas horizontal.
48" Niles car wheel borer.

SHAPERS AND SLOTTERS.

60" Newton slotter.
12" Niles crank slotter.
12" New Haven crank slotter.
8" Slotter, rotary table.
18" Bement-Miles crank slotter.
6" Bement-Miles slotter, rotary tbl.
14" Smith-Mills crank shaper.
16" Smith-Mills crank shaper.
New 17" Simmons single grd. crank.
20" Cincinnati, high duty.
20" Smith-Mills crank shaper.
24" Flather heavy duty.
25" Smith-Mills crank shaper.

AUTOMATICS AND SCREW MACHINES.

No. 52 & No. 53 National Acme.
2" Cleveland automatic.
13-16" National Acme, 4-spindle.
24" Gridley No. 55 4-spindle auto.
2"x24" Jones-Lamson flat turret.
3"x36" Jones-Lamson turret.
No. 32 Garvin turret lathe.
No. 24 Garvin turret, with rocker chuck and lever.

SECOND-HAND MACHINERY

Simmons Machine Co., Inc.—Continued.

MISCELLANEOUS.

Brake, 10' Robinson.
Keyseater, No. 2 Davis.
Pipe machine, 2" Jarecki.
Pneumatic crane, 5-ton Whiting,
37½ span.
Press, No. 59 Toledo straight side.

Press, No. 46 Bliss straight side,
extra heavy frame.
Press, knuckle joint, No. 663 Toledo.
Punch & shear, sgl end, Rock River.
Slitting shear, No. 109 Bliss, & table.

WOOD-WORKING MACHINERY.

Band saw, 36" Root.
Band saw, Napier
Former, No 1 Kane-Roach.
Jointer, 8" American, with c. s.

Router, New Britain No. 2 chain.
Sander, 3 drum 30" Fay-Egan.
Saw table, comb. No. 1 American.
Shaper, dbl spindle. No. 31 American.

FOR SALE BY

The Strong, Carlisle & Hammond Co., Cleveland, O., Detroit, Mich.

ENGINE LATHES.

14"x 6' Prentice, c. r., standard pat.
14"x 6' Flather, c. r., standard pat.
14"x 6' Flather, c. r., standard pat-
tern, with pan.
14"x 6' Flather, compound rest.
16"x 6' Reed, c. r., standard pattern.
16"x 6' Bradford, c. r., 5-step cone,
standard pattern.

16"x 6' Prentice, c. r., standard pat.
17"x 7' Fulton, c. r., g. f. h. plain
turning lathe.
17"x 8' Sidney, c. r. & t. a., 3-step cone.
18"x 10' LeBlond, c. r. & t. a., 5-step
cone, (2).
18"x 10' Springfield, c. r., 5-step cone.
Old style stud lathe.

TURRET LATHES AND SCREW MACHINES.

14" Lodge & Davis, plain head.
14" Lodge & Davis, b. g.
24" Davis turret boring and chuck-
ing lathe, with forming rest.
1" Milliholland plain head turret
screw machine.
No. 4 Warner & Swasey g. f. h. tur-
ret screw machines, (9).
No. 4 Warner & Swasey screw mche.,
with auto. chuck and wire feed

18" Acme screw mche. p. f. to tur., (4).
24" Lodge & Shipley g. f. h. turret
lathe, 3-step cone, 6" belt, p. f. to
turret, with air chuck.
No. 2-A Warner & Swasey hol hex.,
with bar and chucking equipment.
1" A Cleveland automatic.
2" A Cleveland automatic.
No. 00 Brown & Sharpe automatic.
2" Hartford full automatic.

MILLING MACHINES.

No. 3 Garvin, plain, b. g.

No. 2 Bristol, hand, p. f. to table.

GRINDERS.

No. 10 Cochrane-Bly auto. bench
saw filing machine.
Whitney wet tool.
Greenfield univ. cutter and reamer.
B Standard Diamond grinders, (2).

No. 1 Warner & Swasey, cock.
Type "DE" Hisey-Wolf internal.
8" Blount emery stand.
Rivett ball race grinder, with count-
ershaft.

HAMMERS.

Coffman post power dr. 25 lbs., c. s.
100 lb. Cady, belt drop, c. s.
100 lb. Bradley upright helve, (2).

30 lb. Bradley upright helve.
200 lb. Bradley upright helve, (2).

RIVETERS.

11½" throat Giant rivet spinner.

No. 203 Giant rivet spinner.

PUNCH PRESSES.

Toledo double acting toggle draw-
ing press.
No. 11 Badger, hand.

No. 2 Waterbury rack and p. ion
power press.

MISCELLANEOUS.

Cold saws, 12" Burke, (2).
Cold saw, Higley.
Drill, 5 spindle Detroit semi-auto.
Filing machine, Simplex.
Gear cutter, No. 2 Whiton auto.
Hack saw, Excelsior, power.
Hack saws, Victor, power, (3).
Polishing stands, heavy, (2).

Polishing lathes, City Machine Co.,
double end, (8).
Polishing head.
Tapper, 1" Burke, bench.
Tapper, 1" friction vertical bench.
Tapper, Rickert-Shafer, 3/16" horiz-
ontal, on column.
Tapper, Garvin No. 2, sgl. spindle.

SECOND-HAND MACHINERY

FOR SALE BY

Russell Machine Company, 28th St. & A. V. R. R., Pittsburgh, Pa.

LATHES

- | | |
|-----------------------------------|------------------------------------|
| 48" Niles car wheel, m. d. | 20"x12' Prentice, h. s. c. r. |
| 38"x25' New Haven, raised to 56". | 20"x5'6" Walcott, q. c. g. (3). |
| 38"x18' Pond, triple geared. | 16"x 8' Porter, h. s., c. r. |
| 30"x30' Gleason, triple geared. | 16"x 6' Blaisdell, h. s. |
| 30"x14' 8" Schumacher-Boye. | 16"x 5' Hendey, q. c. g., t. a. |
| 28"x16' New Haven. | 15"x 5' Hamilton, h. s. |
| 27"x12' Pittsburgh, dbl. b. g. | 9"x40" Barnes, foot power. |
| 26"x16' Draper, triple geared. | 14"x 5' American speed lathe. |
| 26"x10'6" Walcott, q. c. g. | 24"x11' American semi-auto. turret |
| 24"x16' 6" Johnson lathe. | 14"x 5' Fox brass lathe. |
| 24"x14' Gleason. | Speed lathes, various sizes, (10). |
| 24"x12' Lodge & Davis. | |

PLANERS AND SHAPERS.

- | | |
|--------------------------------------|------------------------------------|
| 24"x24"x 8' Chandler planer, 1 head. | 16" Garvin open throat shaper. |
| 33"x33"x10' Woodward-Powell, 2 hd. | 20" Cincinnati b. g. crank shaper. |
| 36"x36"x12' Pond, three heads. | 24" G. & E. b. g. crank shaper. |
| 72"x36"x12' Betts planer, 2 heads. | 32" G. & E. b. g. crank shaper. |

DRILLS AND BORING MILLS.

- | | |
|---|--|
| Burke sensitive bench Nos. 0 & 1. | Beaman-Smith hor. boring, drilling |
| No. 3 Prentice port. rope drive drills. | & milling mch., 4" bar, 36" travel. |
| 20" Silver, new, plain and bk. gd. | 4' Fosdick plain radial, tap. attach. |
| 20" Foote-Burt mfrs. vertical. | 4' Bickford plain radial, tap. attach. |
| 22" Aurora drill, b. g., sliding head. | Garvin 4 spindle drill press. |
| 24" New Haven plain drill. | Bausch 12 spindle multiple drill. |
| 26" Prentice, b. g., sliding head. | 48" Niles car wheel boring mill. |
| 3' Bickford radial, swing table. | 60 & 76" Bullard vertical bor'g mills. |

HAMMERS, BULLDOZERS AND MILLERS

- | | |
|------------------------------------|------------------------------------|
| 1500 lb. double leg steam drop. | Little Giant 50 lb. power hammer. |
| 1500 lb. single leg steam forging. | No. 0 Bickett plain miller. |
| Bradley cushion helves, 40 lb. | No. 2 Brown & Sharpe univ. miller. |

ENGINES, BOILERS AND PUMPS.

- | | |
|--------------------------------------|---|
| 50 k. w. American steam elect. unit. | 50 h. p. vert. submerged tub. boiler. |
| 4 h. p. Fowler vertical gas engine. | 6 h. p. vertical single flue boiler, (4). |
| 40 h. p. Backus horiz. gas engine. | Pumps, various sizes and makes. |
| 50 h. p. White-Middleton gas engine. | |

PUNCHES, SHEARS AND PRESSES.

- | | |
|--|---|
| 50" throat Reade sgl. end punch and shear; massive construction. | No. 3 R. & K. inc. presses, 2 1/2" str. |
| No. 8 L. & A. geared s. e. punch, | No. 3 Kohler inc. press, 1 1/2" str. |
| 3 1/2" throat, punching cap. 8" x 3 1/2". | No. 56 dbl. housing knuckle press. |
| Niagara No. 24 hand punch, 15" thr. | No. DG-76 Ferracute single acting. |
| Squaring shears, 30"x1-16" & 48"x4". | Straight-side punch press, 4" str. |
| Bliss geared slitting shear, 18" thr. | No. 4 Stevenson foot pwr., 6" thrt. |
| Perkins No. 3 rotary shear, 12" thr. | No. 59 1/2 Toledo drawing presses, (2). |

MISCELLANEOUS.

- | | |
|---|--|
| Air compressor, No. 0 Au-To 3"x4". | Grinder, 10" dbl. e. emery on column. |
| Air compressor, s. cyl. 3x5", belted. | Grinder, Diamond 12" d. end bench. |
| Air compressor, double cyl. 2 1/2"x4". | Grinder, Russell 12" dbl. end bench. |
| Air compressor, 6x6 Laidlaw hor. | Grinder, Lancaster 16" d. e. emery. |
| Bender, Wallace No. 11 angle, hd. pr. | Grinder, Barnes 20" wet tool. |
| Bender, Hinman No. 1 Eye, hd. pr. | Grinder, 20" Ransom w.t., 250 v., d. c. |
| Blower, Root No. 3 Acme, hand. | Grinder, Cincinnati tool and cutter. |
| Blower, pressure, No. 0 Sturtevant. | Grinder, Dayton surface, 1bl. 5 1/2"x36". |
| Blower, pressure, No. 3 Sturtevant. | Grinders, Landis 26x36; Cinti t. & c. |
| Blower, Buffalo No. 8, pressure. | Grinder, twist drill, cap. to 2 1/2". |
| Blower, Buffalo No. 10, pressure. | Hack saw, Sterling, cap. 5"x5 1/2". |
| Brazing table, all iron, 17"x29 1/2"x31". | Mortiser, Williamsport sash. |
| Centering mch., Whiton 6" sgl. spdl. | Polishing stand, Diamond No. 2. |
| Cold saw, Newton, 20" dia., 5 1/2" rd. | Polishing stand, d. end, 42"x3 1/2" arbor. |
| Crane, 10" I-beam, 12'3" span, with | Polishing stand, Cuyahoga dbl. end. |
| Harrington 6,000 lb. chain hoist. | Silent chain belt, 16"x8"x1 1/2" p. |
| Cutting-off mch., Hurlburt R. 4". | Tapping machine, No. 2 Garvin. |
| Grinders, Western Nos. 1, 2 and 3. | Vises, Forges, Tanks, Lockers. |

SECOND-HAND MACHINERY

FOR SALE BY

Cyril J. Bath & Co.,

721 St. Clair Ave., N. E., Cleveland, O.

Selections from Stock

AUTOMATICS.

21" and 41" Model A Cleveland, in very good condition, with large equipment.
No. 33 New Britain auto. chucking machines, 5 stations and tapping spindle, handle work up to 2 1/2" diameter in chuck jaws and 5 1/4" swing outside chucks; very good, (3).

BAR STOCK MACHINES.

2-A Warner & Swasey 5 bar and chucking, very good, (5).

BORING MILLS.

30" Gisholt, single pulley drive, rapid traverse, 3-jaw chuck, good as new.
42" Niles vertical, one swivel, one turret head, 3-jaw table, fine condition.
72" Bullard double swivel head, gear feed, cone drive, 4 face plate jaws; may be inspected in operation.

BULLDOZER.

No. 5 Ajax hi-speed, steel body, 14" stroke very fine cond., weighs 26,000 lbs.

DRILLING MACHINES.

20", 22 1/2", 24" and 28" Sibley drill presses, new. Also two 20" Sibley drill presses, second hand.
2-spindle 24" Barnes all geared drills, pump and piping; fine shape.
Sibley & Ware drill presses, (3).
22" Rockford drill press.
Large Colburn D-3 hi-speed drills; very good condition, (4).

GEAR CUTTER.

26" No. 3 Brown & Sharpe plain, with all parts, very good condition.

GRINDERS.

Cincinnati No. 1 old style cutter grinder, complete, good shape.
Woods tool and cutter grinders, good as new, (4).
Wet and dry Yankee drill grinders.
No. 3 universal Landis grinder, takes 12"x42".
18" Bryant internal grinder, late model excellent condition.
No. 60 Heald cylinder grinders, first class, (3).

HAMMER

No. 6-B Nazel air forging hammer, weighs 32,000 lbs., practically good as new.

LATHES.

19"x 8' LeBlond, steady and follow rests, countershaft, etc.
18"x 8' Mueller engine lathes, q c g, dbl bk grd, very good condition, (2).
20"x 8' Walcott engine lathes quick change gear, countershaft, etc., (2).
24"x 11' Johnson compound rest engine lathe, very good condition, complete with standard equipment.

MILLING MACHINES.

Billings & Spencer die trimming improved miller, first class condition.
No. 00 Brown & Sharpe plain hand miller.
No. 25 Becker plain horizontal miller; almost new.
No. 3-B heavy Brown & Sharpe hi-power, fine shape.
No. 4 Brown & Sharpe cone type with dividing hds., vert. att., etc., very good.
AB1 Becker hi-power vertical, fully equipped with oil pump and countershaft.
No. 3 Becker universal, with dividing heads, vise, countershaft, etc.

PLANERS.

32"x 22"x 5' J. S. Wheeler, one belt on each side, quick return to table, first-class operating condition.
36"x 36"x 14' Pond single head, with table 6" thick, no broken T slots or pegged gears, a good rugged tool, fine condition.

PRESSES.

31-A Bliss toggle drawing press, 30" between uprights, very good condition.
No. 70 1/2 Bliss straight side press, tie rod frame, knockout rods, etc.

SAWS.

Metal band saws, (2).
Peerless hi-speed 6"; new, (3).

SHAPER.

24" Juengst horizontal crank, worm gear drive; good condition.

MISCELLANEOUS.

No. 0 Ajax return roller; very good.

SECOND-HAND MACHINERY

FOR SALE BY

E. L. Esley Machinery Co., 551-557 Washington Blvd., Chicago, Ill.

DRILL PRESSES.

8' Niles full universal radial.
No. 24 Avey single spindle.

24' Cincinnati Bickford pl. radial.
No. 11 Natco multiple drills.

GRINDERS.

No. 1 Cincinnati, universal.
No. 3 B. & S. comb., cutter & reamer
No. 190 Wells cutter and reamer.

No. 1 Norton univ. cutter & reamer.
No. 1 4"x20" Morse cylindrical.
No. 2 10"x32" Ott universal.

LATHES.

11"x 8' Star.
16"x8' Lodge & Davis, taper att.
16"x 8' Von Wyck, taper att.
18"x 8' Bradford, q. c. g., taper att.

20"x 8' Hamilton.
22"x12' Greaves & Klusman.
24"x12' Prentice Bros.
36"x14' Bradford.

SCREW MACHINES.

1" Cleveland automatic.
1" Cleveland automatics.
No. 5 Pearson, hand, fric. head.
1"x15" Pratt & Whitney, plain head.

No. 4 Foster, plain head.
No. 224 Garvin, 1 7-16" capacity friction head.
1" Smurr & Kamen, plain head.

MISCELLANEOUS.

Boring mach., No. 0 Fosdick.
Broaching machine, No. 3 Lapointe.
Cold saw, No. 14 Higley.
Gear cutter, No. 12 B. & S. auto.
No. 2 Pratt & Whitney hand miller.
Miller, No. 32 Kemp Smith, Lincoln type.

Pipe machine, No. 94 Merrell.
Planer, 26"x22"x8' Gleason.
Planer, 32"x32"x12' Davis & Egan.
Planer, 42"x42"x8' Whitcomb.
Punch, No. 16C New Doty, sgl. end.
Turret lathe, 2"x24" J. & L.

FOR SALE BY

A. D. White Machinery Co., 108-114 N. Jefferson St., Chicago

PUNCH PRESSES AND PUNCHES AND SHEARS.

No. 3 Consolidated, o. b. i.
No. 3 American Can, o. b. i., (3).
No. 3-P Ferracute, solid back.
Waterbury reducing press, 7 1/2" str.

No. 29 Bliss, gang, double action.
No. 6 L. & A., 4" thr., cap. 1/4" s. e.
Rock River d. e. 24" thr., cap. 1/4".
No. 37 Williams & W. gang punch.

DRILL PRESSES.

21" Cincinnati, tapping attach.
22" Rockford, stationary head.
36" Bickford, sliding head.

42" Barnes, sliding head.
42" Miles radial, plain.
New drills, 14" to 24".

ENGINE LATHES.

14"x 6' LeBlond engine lathe.
16"x12' Beaman & Smith, taper.
30"x 8' Boye-Emmes, d. b. g., q. c.

24"x10' Putnam.
26"x25' Blaisdell.
New lathes 13" to 18".

MILLING MACHINES AND PLANERS.

No. 1 Brown & Sharpe plain.
No. 3 Cincinnati plain.
No. 5-B Becker vertical, (2).
22"x22"x5' Ingersoll slab.

No. 6 Brainard, Lincoln.
16"x16"x36" Draper planer.
30"x27"x 6' Putnam planer.

SCREW MACHINES.

7-16" Cleveland, friction feed.
1" Cleveland, friction feed.
1" Cleveland, friction feed.
1" Cleveland, jigger feed.

1" Hartford, (3).
1" Cleveland.
1 1/2" LaVigne.
1 1/2" Cleveland, semi-automatic.

MISCELLANEOUS.

Blower, No. 7 Sturtevant high pressure.
Gas engine, 35 h. p. Columbus.
Gas engine, 55 h. p. Bruce McBeth.
Grinder, No. 38 Safety Plow.
Grinder, Springfield, double wheel water.
Grinder, Leland & F., water.
Hammer, 500-lb. Sandage.

Hobber, No. 1 Farwell.
Oil gas generator, No. 3 American.
Rivet spinner, Grant, 3/16" & 5/16".
Saw, No. 54 Nutter-Barnes.
Tappers, No. 1 Garvin automatic, (3).
Tube cutter, No. 5 Fox.
Turret lathe, No. 3 Foster, pl. hd.
Turret lathe, 24"x25" Greenlee.
Turret lathe, 20" Fay & Scott.

SECOND-HAND MACHINERY

FOR SALE BY

Brown-McDonald Machinery Co., 2323 N. 9th St., St. Louis, Mo.

BORING MILLS.

49" Bullard, vert., 1 plain & 1 swivel hd. on cross rail, face plate jaws, used.
37" Bullard, vertical, 2 swivel heads, 1 turret, 1 plain, used.

LATHES.

13"x 6' South Bend, c. r., h. s., new.	16"x 8' American, q. c. g., used.
13"x 6' Champion, c. r., h. s., new.	20"x 10' Walcott, q. c. g., d. b. g., c. r., h. s., new.
15"x 8' South Bend, c. r., h. s., new.	20"x 10' Walcott & Wood, h. s., cpd. r., used.
16"x 8' South Bend, c. r., h. s., new.	14"x 6' Fitchburg, s. s., p. r., used.
16"x 8' Walcott, q. c. g., d. b. g., c. r., h. s., new.	

DRILLING MACHINES.

No. 1 Burke, bench, with chucks, new.	24" No. 101 C-O radial new.
Avey, high speed bench.	20" Silver, s. b., w. & l., new.
Demco, high speed, bench, used.	20" Silver, s. b., b. g., p. f., new.
14" Excelsior, 2 tables, new.	20" Champion, s. b., w. & l., new.
1/2" Leland Gifford, high speed, with pump.	20" Champion, s. b., b. g. & p. f., new.
	26" Aurora, b. g., p. f., new.
	30" Prentice, s. b., s. h., p. f., used.

SHAPERS.

20" Milwaukee, b. g., latest imp., new.	16" Queen City, back geared, used.
18" & 24" Hollingsworth, new.	24" Gould & Eberhardt, used.

SCREW MACHINES.

No. 4 Smurr & Kamen, geared friction head, p. f. to turret, new.
No. 4 Defiance, geared friction head, p. f. to turret, used.
No. 53 National Acme automatic, used.
No. 52 National Acme automatic, used.
Wood Tilted Turret.

MILLING MACHINES.

No. 1 U. S. hand, vise and arbor, new.
No. 2 Pratt & Whitney, Lincoln type.
No. OY Brown & Sharpe, used.

PRESSES.

No. 1 Loshbough-Jordan, o. b. l., new.	No. 57 Swaine, gaered, new.
No. 3 Loshbough-J., o. b. l., new.	No. 53 Swaine, used.
No. 4 Loshbough-J., o. b. l., new.	No. 19 Bliss, o. b. l., used.
No. 3 Kohler, o. b. l., used.	No. 1 Greenerd, arbor, used, (9).
No. 4 American, o. b. l., used.	No. 2 Greenerd, arbor, used, (6).

SAWS.

Nos. 1 & 2 Marvel, draw cut, new. | Williamson, metal, used.

GRINDERS.

Nos. 1, 2 & 3 Western, d. e., new.	Esaley, cylindrical.
Nos. 1, 2 & 3 St. Louis, d. e., new.	No. 190 Wells, reamer & cutter, new.
No. 20 Safety E. W. Co., elec. (4).	Greenfield universal tool & cutter, used.
U. S., electric, 110 v., d. c., bench.	
Heald, ring, 20", used.	

COMPRESSORS.

Nos. 2, 3 & 4 Model B, vertical, belted, new.

MISCELLANEOUS.

Bolt threader, No. 734 Greenfield new.	Motor, 1 h. p. Advance, sgl. ph., new.
Brake, 6' Dreis & Krump, 16 ga. .	Pipe mch., No. 96 Forbes, 4", used.
Filing mche. No. 3 Cochran-B. used.	Pipe machine, No. 76 Forbes, 3", used.
Motor, 5 h. p. General Electric, 3 ph., new.	Pipe machine, 3" Borden, hand.
Motor, 10 h. p. General Electric, 3 ph., new.	Planer, 36"x36"x12' Patch, o. s., 1 hd. on cross rail, 1 head on side, used.
	Large stock of tinner's tools.

CHUCKS.

8" & 9" 3-jaw Sweetland, scroll, new.	5", 6", 7", 9" 3-jaw Cushman, univ., used.
8-12-14-16" 4-jaw Sweetland, independent, new.	16" 4-jaw Wescott, combination, cutting off.
No. 18 National Acme, s. o., die hd.	

SECOND-HAND MACHINERY

FOR SALE BY

B. C. Allen Machinery Co.,

104 S. Clinton St., Chicago

Band saw, metal.....	\$ 115.	Lathe, 10" Star.....	\$ 100.
Blowers, Nos. 1, 4 and 6.....		Lathe, 14"x8" Barnes.....	145.
Blower, positive, 2" opening.....	45.	Lathe, 12"x5" Reed.....	125.
Bolt cutter, 2" solid die.....	90.	Lathe, 18"x 8", plain rest.....	300.
Bolt cutter, 1 1/2" Merriman.....	225.	Lathe, 21"x8", plain rest.....	400.
Drill, 20" lever feed.....	55.	Lathe, 24"x14" Draper, q. c. g.....	950.
Drill press, 15" \$60 & \$65.....		Lathe, 26"x16" Wright.....	700.
Drill press, 20" Barnes 2 sp.....	250.	Lathe, 36"x16" Putnam.....	1000.
Drill press, 22", sliding head.....	100.	Lathe, 16" Warner & Swasey.....	200.
Drill press, 24" b. g.....	150.	Lathe, turret, 12" Warner & S.....	110.
Drill press, 26", power feed.....	150.	Lathe, 14" Fox.....	200.
Drill press, 3-sp. sen., D. Slate.....	100.	Miller, No. 2 Hendey, plain.....	875.
Drill press, 3" sp. Henry & W.....	150.	Press, foot.....	35.
Drill press, 4" radial.....	650.	Press, No. 5 1/2 Walsh, geared.....	950.
Emery grinders, all sizes.....		Press No. 2.....	125.
Forge with hood.....	12.	Screw machine, 1" Warner & S.....	325.
Hack saw, No. 1 Marvel.....	20.	Shaper, 15" crank.....	300.
Hack saw, No. 2 Marvel.....	40.	Shaper, 18" crank.....	250.
Hack saw, Racine high speed.....	100.	Shaper, 24" Steptoe.....	400.

FOR SALE BY

The Osborne & Sexton Machinery Co.,

Columbus, Ohio

LATHES.

9" to 13" Barnes, h. s., cp. r., new.	19"x12" Gray, compound rest.
13-15-16 and 18 O & S, h. s., c. r., new.	20"x10" Hamilton, double back gear.
16x6 Seneca Falls rel. att., q. c.	21"x10" and 24"x12" South Bend.
18"x 8" Fitchburg, hol. spdl., cp. r.	24"x12" New Haven, h. s., c. r.
18"x 8" Monarch, q. c. taper.	25"x24" Fifield.

TURRET LATHES AND SCREW MACHINES.

1" Garvin hand screw machine	No. 6 W & S screw machine
1 1/2" S. & K. hand screw mches., (3).	2x24 & 3x36 J. & L. dbl. equipment.
1 1/2" Tilted turret hand screw mche.	4" Hartford single spindle auto.

SHAPERS AND PLANERS.

14" Niles, traveling head.	22"x22"x 6" Gray, 1 head.
16, 18 & 24" Barker, back gear crank.	32"x32"x10" Niles, single head.
16" Kelly crank, back geared.	36"x36"x16" Niles, double head.
20" Walcott geared shaper.	60"x60"x17" Betts, double head.

PRESSES.

No. 1 Consolidated and Toledo, (10)	Pneumatic, 20 ton, 37" bet uprights.
No. 2 Sidney o. b. inclinable, 1600 lb.	Perkins dbl crank, 16x24 bolster.
No. 32-P Toledo.	Covington, 10" 6" between housing.

DRILLS AND RADIALS.

Henry & Wright sgl. spdl., high spd.	High speed sgl. spdl. Cleveland.
3 1/2" Canedy-Otto plain, new.	20" Aurora, with tap. attachment.
4" Baush plain, heavy pattern.	20", lever feed. (30).
4 1/2" Universal, cone drive.	24", 26" and 28" sliding head.
Sensitive 1, 2 & 3 spindle.	Quint 6-hole turret drill.

MILLING MACHINES.

No. 12 Brown & Sharpe, (2).	No. 1 1/2 American plain.
No. 1 1/2 Valley City universal.	No. 1 1/2 Valley City plain, new.
No. 4 Cincinnati plain.	No. 3 Brainard, 30x7 table.

GRINDERS.

No. 3 W & M. wet surface.	30x10 Webster & Perks, univ., new.
Landis 10x24 universal.	Cutter, reamer and tool, new.
Litter 10x20 universal.	Cincinnati cutter and tool.

MISCELLANEOUS.

Balancing machine for pulleys.	Hammer, 55 Williams White Justice.
Band saws, metal, 30" Wright, (2).	Motor, 75 h. p., 220 volt, 3 phase.
Boring mill, 12", 2 swivel heads.	Pipe machines, 4, 6 and 12".
Compressor, 8"x8" H. & B. belt.	Punch & shear, No. 3A Royersford,
Cut-off machine, 3" Davis.	double end.
Dynamo, plating, 2500 amp., 8 volt.	Straightening rolls, 57" for 8 plate.

SECOND-HAND MACHINERY

FOR SALE BY

Stocker-Rumely-Wachs Co., 117-121 N. Jefferson St., Chicago

In stock for immediate delivery.

BORING MILLS.

- 24" Industrial Works horizontal boring mill.
- 60" Bullard, with two swivel heads.
- 72" Bullard, with two swivel heads.
- 100" Canadian Machinery Corporation, with two swivel heads.

DRILLING MACHINES.

- Rockford bench drill.
- No. 1 Avey high speed drill.
- No. 2 Avey high speed, 3 spindles.
- No. 3 Avey high speed, 2 spindles.
- 24" Fosdick radial drill.
- 5' Fosdick radial drill.
- 6' Gang radial drill.
- No. 9 Prentice Bros. radial drill, 6' arm.

GEAR CUTTERS.

- 26" No. 3 Brown & Sharpe.
- 30"x8" Gould & Eberhardt gear cutter for spur gears.
- No. 3 Farwell gear hobber.

GRINDERS.

- No. 12 Brown & Sharpe universal tool grinder.
- No. 1 Cincinnati universal tool and cutter grinder.
- No. 6 Modern, internal grinder.

LATHES.

- 18"x 6' Bradford, compound rest.
- 24"x12' Schumacher & Boye, compound rest.
- 22"x18' Bradford, compound rest.
- 37"x14' Fifield, compound rest.

MILLING MACHINES.

- No. 2 LeBlond plain milling machine.
- No. 15 Garvin plain, with vertical spindle attachment.
- No. 5 Becker vertical milling machine.

PUNCHES AND PRESSES.

- No. 54 Perkins sprue cutter.
- No. 2-P American Can.
- No. 3 American Can, o. b. l.
- No. 16 Bliss, horn press.
- No. 205-H Toledo crank geared press, new, gap pattern, 96" between housings.
- No. 7 Massillon single end punch and shear, 36" throat, arch. jaw, capacity 14" thru 1", new.

SCREW MACHINES.

- No. 2 Warner & Swasey, plain head, automatic chuck and wire feed.
- No. 2 Foster, plain head, automatic chuck and wire feed.
- No. 4 Warner & Swasey universal, automatic chuck and wire feed.
- No. 6 Warner & Swasey, geared friction head, automatic chuck and wire feed, power feed to turret slide.
- No. 6 Foster, friction, automatic chuck and wire feed, power feed to turret.
- No. 9 Bardons & Oliver geared friction head, automatic chuck and wire feed, power feed to turret and cut-off slides.

MISCELLANEOUS.

- Shaper, 16" Baker, vertical.
- Slotter, Canadian Machinery Corporation, good as new.
- Tapping machine, No. 2 Garvin.

SECOND-HAND MACHINERY

FOR SALE BY

J. L. Osgood, **45 Pearl St., Buffalo, N. Y.**
 Chucking lathe, 21" Potter & Johnson, \$380.
 Cylinder grinders, No. 60 Heald, (2).
 Screw machine, No. 5 Warner & Swasey, \$375.
 Shell cutting-off machine 14" Williams.
 Turret lathe, 12" Brown & Sharpe, \$200

FOR SALE BY

Strafer Machinery Co., **318 N. Front St., Baltimore, Md.**
 Drill press, No. 25 Foote-Burt high duty, single pulley drive.
 Grinder, 10"x50" Norton, arranged motor drive, fine condition.
 Grinder, No. 2 Brown & Sharpe surface, rebuilt, low price.
 Lathes, 21"x8" LeBlond heavy duty, used three months, price right.
 Lathe, 18"x8" Chard, semi quick change, modern, overhauled.
 Lathes, 18"x9" Bell heavy duty, s. q. g., c. r., 3 step, d. b. g., half price.
 Lathes, 26" heavy duty Bridgefords, short beds, q. c., low price.
 Lathe, turret, 24" Gisholt, used three months, guaranteed bargain.
 Miller, No. 5 Becker Brainard plain horizontal, low price for rough work.
 Planer, 28"x28"x 8" New Haven, one head, fine condition.
 Planer, 48"x48"x10" Powell, one head, perfect condition.
 Sold on approval; money returned if not satisfied.

FOR SALE BY

The E. A. Kinsey Co., **Cincinnati, Ohio, Indianapolis, Indiana**
DRILLING MACHINES.

20" Hoefer, b. g., p. f., sta. hd.	1/2" type T., U. S. Elect. 220 v., 60 cy.
1/2" type BA-1 U. S. Electric, 220 volts,	Bausch 4-spindle multiple.
60 cycle, 3 phase.	

GRINDERS.

Grinder, 16x36 Queen City plain.	Grinder, No. 2 Brown & S. univ.
Grinder, No. 2 Cincinnati universal,	Water tool, 26 in. wheel.
complete.	Wesche electric buffing, a. c. motor.

LATHES.

16"x 8" Seneca Falls, q. c.	19"x10" Greaves-K., c. r., s. & f. r.
18"x 8" Rockford, q. c.	30"x30" Harrington, s. b. g.

PLANERS.

32"x32"x8" New Haven.	24"x30"x6" Gray, 1 head, (2).
18" Niles-B.-P. plate, 1/2" steel plate.	26"x30"x6" Ohio, 1 head.
34-34x30 H. P. Betts; rev. d. c. motor.	

TURRET AND SCREW MACHINES.

No. 1 Am. Tool & M. Co., sq. ar., s. b. g., 4 s. c.	3x36 Jones & Lamson flat turret.
20" No. 7 Hardons & O., g. fr. hd.	No. 2 Warner & Swasey, (3).
No. 4 Brown & Sharpe, w. fd., (7).	No. 2 Garvin, w. l., power feed turret, automatic chucks.

MILLING MACHINES.

Milling mche., No. 1 B. & S. univ., spiral head centers.	40" Newton plain.
Milling and drilling machine No. 2 Knight.	No. 3 Cincinnati plain.
	Newton 21"x8" slab miller.
	No. 13 Brown & Sharpe plain.

MISCELLANEOUS.

Abrasive metal cutter, 12" Peters.	Oil pump, Trahern No. 1 F. rotary.
Band saw, 26" Towsley, with motor.	Profilier, Pratt & W. No. 12, belt.
Bolt cutter, 2 1/2" Acme, dbl. spindle.	Riveter, 3-16" Schuster, on ped.
Centering att., Carrol No. 2, cap. to 2".	Saw bench, Beach, table 36x54".
Chain machine, Cross & Spiers.	Screw mche., No. 2 Brown & Sharpe automatic.
Chuck, 12" universal.	Special internal grinding fixture Brown & S., for No. 1 universal.
Cutting-off mch. 3" Hurlbut-Rogers.	Tapping machine, Garvin No. 1.
Gas furnace, No. 93 Stewart dbl. end.	Vise, flanged, Brown & Sharpe No. 4.
Gear hobber, 18" Gould & Eberhardt.	
Gear hobber, No. 3 Farwell.	

SECOND-HAND MACHINERY

FOR SALE BY

Harris Brothers Company, - 35th & Iron Sts., Chicago, Ill.

ENGINE LATHES.

Screw-cutting quick change mechanism, 3-step cone, dbl. bk. grd., comp. rests:
18"x 6' Ryerson, (4). | 20"x10' Canada Machy. Corp., (5).
18"x 8' Sidney, (2).
With turrets on carriage without compound rests:
18"x 6' Canada Machy. Corp., (2). | 20"x 8' McDougall, (3).
With loose change gears, 3-step cones, dbl. back grd., and compound rests:
18"x 8' Sidney, (3). | 18"x 8' Milwaukee, (6).
With loose change gears, compound rests, single back geared:
15"x 8' Williams. | 18"x 8' P. P. Silk, (3).
18"x 6' Cincinnati. | 21"x 7' Bertram.
18"x 8' Barker, (4). | 22"x10' Bradford.
18"x 6' Giddings & Lewis, (4).
Plain turning lathes with plain rests. (Not screw cutting):
16"x 6' Rockford, pan bed, (10). | 20"x 8' Simplex, (4).
With turret on carriage but without plain rest:
18"x 8' Milwaukee, (10).
All the above lathes have hollow spindles and countershafts.

DRILL PRESSES.

Colburn 25" swing, heavy duty, high speed, No. 5 Morse taper, single pulley drive, (9). | Barr 2-spindle 14" sensitive, cap. 1/2".
Brown & Sharpe 36" vertical boring mill, with tur. hd. and chuck jaws.

GRINDERS.

Wells Bros. cutter and reamer. | No. 1 Fraser universal cylindrical
Surface grinder, table 19x54" with 8" swing, 20" centers.
magnetic chuck 14"x6". | Ford Smith cylindrical grinders, (2).
Yankee twist drill grinder.

TURRET LATHES.

Jones & L. 3"x36" bar outfit, (3). | W. P. Davis 24" swing set over turret, all power feeds, (2).
Warner & Swasey No. 4, 16" swing.

MILLING MACHINES.

Rockford No. 1 1/2 plain table, 30"x9".
Ford-Smith No. 3 plain table, 46"x10".
No. 6, 48" swing vertical Becker, latest type, improved standard miller, all power feeds, longitudinal 62"; transverse 20"; vertical 20"; power down feed to spindle head, 12" power feed to rotary.

HACK SAWS.

Racine high speed, 6" capacity. | Peerless high speed, 6"x6".

PUNCH PRESSES.

Williams straight sided, b. grd., sgl. action punch press, 22" between uprights.

TESTING MACHINES.

Tinius Olsen tensile testing machine, 4-screw type.

HAMMERS.

Mayer Brothers 250 lb. trip hammer. | Board lift drop hammers, 2000 lb., (2).
Board lift drop hammers, 1000 lb., (2).

PUNCHES AND SHEARS.

Long & Allstatter combination shear and beveling mche., wt. about 25,000 lb.
Alligator shear for 14"
Wiener steel plate "I" beam shear for 15" "I" beam.
Thompson bevel cutting shear, 1/2" plate.
Hilles & Jones sgl. end punch, 8" throat, architectural jaw, cap. 1/4" thru 1/2".
Hilles & Jones 20" throat, single end punch, cap. 1/4 through 1/2".

TRAVELING CRANE.

Niles electric traveling crane, 46' span, 15 ton cap., with auxiliary hoist, 5 ton, 4 motor type, 220 d. c.

1000 lbs. of Stellite and Red Cut High Speed Steel.

Our complete Machinery Bulletin sent upon request.

SECOND-HAND MACHINERY

FOR SALE BY

Vernier Manufacturing Co., - - - **Cedar Rapids, Iowa.**

Gasoline engine, 14 h. p. Monitor, with 22" clutch pulley, used about two years; price, \$225. f. o. b. Cedar Rapids.

Power roll, heavy, 64" between housings, estimated weight one ton, cap. $\frac{3}{4}$ " plates; price, \$200. f. o. b. Cedar Rapids.

Changes in our line necessitate change in machines and we are making the above liberal offer to move quickly, so as to secure the space the machines occupy.

FOR SALE BY

C. M. Thompson Co., - - - **35 S. Clinton St., Chicago**

REBUILT TOOLS.

Drills, motor driven bench and sensitive floor, new and used.

Lathes, 26x16', 18x8', 16x6' and 13x5'.

Planer, 27x8'.

Turret lathes, 2" and 3" Jones & Lamson.

NEW TOOLS.

Drill, 20" Champion.

Grinders, hack saws, hack saw blades, and other equipment.

FOR SALE BY

Federal Machinery Sales Company,

8 N. Jefferson St., Chicago, Ill. 208 Sycamore St., Milwaukee, Wis.

USED and NEW Tools.—Immediate shipment.

THREAD MILLER.

Used Lees-Bradner No. 8, 4' 6" centers.

RADIAL DRILLS.

Used 5' Bickford, plain cone drive.

Used 5' Bickford, full universal.

Used 4' Dreeses plain, gear boxdrive.

DRILLING MACHINES.

Used 20" Prentice, lever feed (3).

New Snyder 28" s. h., b. g., p. f.

New Cleveland 36" s. h., b. g., p. f.

New 3' Mueller pl. radial, g. box dr.

GEAR SHAPERS.

Used 24" Fellows.

Used 36" Fellows.

GRINDERS.

Used Cincinnati No. 1 universal cutter grinder.

Used 12" Waukesha precision ring and surface, magnetic chuck.

Used No. 2 Diamond open side surface grinder, table 36"x12".

LATHES.

New Dalton type B-4, 6"x36" bench lathes on legs, (2).

Used 16"x6' Reed hollow spindle, plain rest.

New Oliver 16"x7', quick change gear.

Used 16"x8' Porter, single back gear, plain rest, chuck.

New 18"x6' Hollingsworth, with taper attachment.

Used 18"x10' Springfield, h. s., single back gear, revolving turret tool post.

Used 19 $\frac{1}{2}$ "x13"x4" Flather, quick change gear, h. s., c. r., relieving attach.

Used 21"x10' lathe, l. c. g., compound rest, chuck.

Used Pond 21"x17 $\frac{1}{2}$ ' single back gear, compound rest, 36" chuck.

Used 36", raised to 42"x16' Fitchburg plain turning, c. r., single back gear.

MILLING MACHINES.

Used No. 2 Cincinnati universal.

Used No. 3 Cincinnati universal.

Used No. 4 Brown & Sharpe univer-

sal.

MISCELLANEOUS.

Pipe machine, 4" Victor, used.

Planer, 30"x30"x6' Enterprise, 1 head, used.

Turret lathe, 20"x8' Bridgeport, used.

Above list is incomplete. Write us, giving specifications of anything required.

SECOND-HAND MACHINERY

FOR SALE BY

McCoy-Brandt Machinery Company

Office and Warehouse, 210-218 Penn Ave., Pittsburgh, Pa.

BOLT CUTTERS.

- 14" Acme, double-head, with motor. Nut tapper, 2-spdl. Acme, 14", pan.
14" Acme, dble.-hd., oil pump, pan.

DRILLING MACHINES.

- Multiple 8-spindle Foote-Burt. 24" Barnes, plain, sliding head.
20" Baker heavy duty, power feed. 24" Cincinnati, pwr fd., sliding hd.
24" Colburn hvy. duty, No. 4 Morse. 28" bk. grd., pwr. fd., sp. 1-3/16" hole.

LATHES—TURRET.

- 3x36" J. & L., chucking equipment. 3x36" J. & L., bar equipment.
24" Garvin, 6-hole hexagon turret, B. & S. 14" h.s., 7-hole round turret,
12" box chuck. 9" box chuck.

GRINDERS.

- 126" Bridgeport, cupwheel, knife. Bath univ. tool & cutter, 14x40".
B. & S. plain, 12x12", auto. feed. No. 12 B. & S. univ. & tool, auto. fd.

MILLING MACHINES.

- No. 1 B. & S. plain, hand feed. No. 3 Cincinnati plain, q. c. g.
No. 3 B. & S. universal, 12" index No. 2 Cleveland, universal.
head, table 10x50".

LATHES.

- 48" Niles car wheel turning, journal 16" x 6" Prentice, h. s., c. r., 12" 4-
attachment, m. d. jaw chuck.
42" x 30" Niles boring lathe. 16" x 6" R. M. & C., h. s., c. r., 12"
24" x 15" Fifield, solid spdl., pln. rest. 4-jaw chuck.
24" x 12" S. B. & E., 5" raising blocks, 16" x 6" LeBlond, h. s., c. r., 12" 4-
h. s., c. r., 15" 4-jaw chuck. jaw chuck.
18" x 8" Rockford, q. c. g., h. s., c. r. 16" x 6" Hendey, geared hd., q. c. g., c. r.
17" x 8" Sidney, q. c. g., d. b. g., c. r. Speed lathes, 17", 15", 13"—4' bed.

MOTORS AND GENERATORS.

- 30 & 20 h. p., 3-60-220 v. 7 1/2 h. p. Triumph, 220 v., d. c., elev. duty
10 h. p. Fairbanks, 2-60-440 v. 15 h. p. G. E., 500 v., d. c.
1 h. p., 2-60—220 v., 1800 rev. 90 k. v. a. Lincoln, 3-60-220 v.
10 & 4 1/2 h. p., series wd., 220 v., d. c.

PRESSES AND BRAKES.

- Perkins punch, 2" stroke, 4,500-lbs. 13" 6" Garrison brake or press, cap.
Consolidated, geared, 4" stroke. 1/2", weight 118,000 lbs.
8" Robinson toggle press.

PUMPS.

- 24" x 24" Deane deep well, 25 g. p. m. 3 1/2" x 16" Deane triplex, belted.
for motor drive. 7x5x16" Hall, duplex, steam.

PUNCHES, SHEARS AND ROLLS.

- 48" throat Reade, cap. 1 1/2" thru 1 1/2". Guillotine shear, No. 3 Cleveland,
38" throat Whitney, cap. 1" thru 1". 34" stroke, capacity 2" sq.
36" throat Whiting, cap. 1" thru 1". Guillotine shear, No. 5 Cleveland,
36" thrt., Cleveland, cap. 1" thru 1". 3" stroke, capacity 2 1/2" sq.
15" throat, sgl., cap. 1 1/2" arch jaw. Guillotineshear, Cleveland, 3" stroke,
15" throat, double, capacity 1 1/2" x 1". capacity, 2" square.
Williams-White No. 13. Slitting shear, rotary, 23" throat,
14" throat, double, capacity 2 1/2" x 1 1/2". capacity 1 1/2", Newbold.
No. 11 Williams-White. Bevel shear, Thompson, rated cap. 1 1/2".
50" thrt., sgl., cap. 1 1/2" x 1" Cincinnati. Squaring shear, 108", capacity 1 1/2".
Guillotine shear, No. 3 Wilder, cap. 1, 1 1/2" stroke. 26" pwr., cap. 16 ga.
1, 1 1/2" stroke. Rols, 10" Bertsch, cap. 14" gauge.

SHAPERS AND PLANERS.

- 24" Cincinnati, crank, b. g., vise. 24" x 24" x 6" American, 1 head.
24" Queen City, crank, b. g., vise. 20" Cincinnati, crank, d. b. g., vise.
30" x 30" x 10" sellers, 1 head.

STEAM HAMMERS.

- 1000 lb. N.-B.-P. dble. frame, (4). 700 lb. Pittsburgh, dble. frame, (3).
700 lb. N.-B.-P. dble. frame, (6). 600 lb. Morgan, double frame, (7).

MISCELLANEOUS.

- Boring mill, No. 1 Sellers horizontal Pipe machine, 8" E. C. & B., dies.
2 1/2" bar. Riveter, 3" Shuster.
Compressors, 9x5x10" Westinghouse. Seamer, 30" dbl. P. S. & W., hand.

SECOND-HAND MACHINERY

FOR SALE BY

Girard Machine & Tool Co., 491-493 N. Third St., Philadelphia, Pa.

Engine lathe, 36"x23" Johnson, triple geared and gear face plates, with two sets of raising blocks 52" to 62".
 Engine lathe, 28" Fitchburg, double back geared.
 Engine lathes, 26"x14" American, double back geared, quick change, (2).
 Engine lathes, 26"x12" Wickes, double back geared, (2).
 Engine lathes, 26"x14" Wickes, double back geared, (2).
 Engine lathe, 28"x16" Blaisdell, taper attachment, 12" between centers.
 Engine lathes, 24"x10" Lodge & Shipley, late type, (3).
 Engine lathe, 21"x12" Lodge & Davis, taper attachment, 7' between centers.
 Engine lathes, 18"x8" Lodge and Shipley, dbl. back geared, quick change, (2).
 Engine lathes, 16"x8" Lodge & Shipley, double back geared, taper att. (4).
 Engine lathes, 18"x5" American, double back geared, quick change, (12).
 Engine lathes, 16"x5" LeBlond, double back geared, quick change (10).
 Lathes, lot of 12", 14" and 16" quick change, with various size beds.
 Grinder, No. 1 Cincinnati, universal cutter and tool, standard equipment.
 Grinder, No. 2 Bath universal, with standard equipment.
 Grinder, No. 13 Brown & Sharpe universal.
 Grinder, No. 2 Brown & Sharpe universal.
 Planers, 36"x36"x12" Wilson, two heads on cross rail.
 Shapers, 16" Gould & Eberhardt; 20" and 24" Kelly, and 24" Queen City, all late type and back geared.
 Turret lathes, 2"x24" J. & L., grd. set-over hd., sgl. pulley dr., bar equip., (4).
 Turret lathes, 3"x36" J. & L., late type, 24" and 21" Gisholt late type, (5).
 Large lot of screw machines, drill presses, punch presses, etc.
 Send for our List.

FOR SALE BY

Frank Toomey, Inc.,

127-131 N. Third St., Philadelphia, Pa.

LATHES.

13"x 5' new Reed-Prentice type.
 13"x 7' 6" new Carroll-Jamieson, plain change.
 14"x 6' Neat, double back geared.
 14"x 6' new Carroll-Jamieson, quick change.
 15"x 6' new Sidney, quick change, swings 17".
 16"x24" new Rahn-Larmon, double back geared, quick change.
 17"x 8' new Sidney, quick change, swings 19".
 19"x 8' new Sidney, quick change, swings 21".
 25"x14" new Sidney, quick change, swings 27".
 33"x12" Putnam.

TURRET LATHES.

21" Davis chucking. No. 1 Bardons & Oliver, screw.

VERTICAL BORING MILLS.

60" Bullard, two heads. 64" Niles, two heads.

PLANERS.

48"x48"x12" Hamilton, 4 heads, motor drive. 31"x23"x68" Smith, one head.
 36"x36"x 8" Gray, two heads. 18"x 8"x 3' Wheeler, one head.

SHAPERS.

16" new Steptoe, b. g. 24" new Steptoe, b. g.
 20" new Steptoe, b. g. 16" Barker, traveling head.

MILLING MACHINES.

No. 4 Brown & Sharpe, plain. No. 0 Steptoe, hand, new.
 No. 3 Cincinnati universal. No. 1 United States, new, hand.
 No. 14 new American, plain.

GRINDERS.

No. 1 Landis internal. No. 1 Grand Rapids new cutter and reamer.
 No. 1 Fraser universal, new.

DRILLING MACHINES.

60" Bickford radial. 32" new Superior, sliding head.
 48" Fosdick radial. 28" new Superior, sliding head.
 6" new Superior, sliding head. 25" new Superior, sliding head.

SECOND-HAND MACHINERY

FOR SALE BY

Dale-Brewster Machinery Co., Inc.,

541-7 W. Washington Blvd., Chicago; 54-60 Lafayette St., New York

In Stock at Chicago and New York

NEW MACHINES.

LATHES.

36"x12' Wicken, q. c. g., d. b. g.
24"x13' Chard, q. c. g., d. b. g.
24"x10' Advance, q. c. g., d. b. g.
20"x11' Chard, q. c. g., d. b. g., (2).
20"x9' Chard, q. c. g., d. b. g.
18"x 9' Chard, q. c. g., d. b. g. (5).
18"x 8' Advance, q. c. g., d. b. g.
16"x 9' Chard, q. c. g.
16"x 8' Cisco, q. c. g.
16"x 8' Cleveland, tool room.
16"x 7' Chard, q. c. g.
16"x 6' Cleveland tool room, (3).
14"x 6' Amtew, d. b. g.

13"x 6' Lancaster.
12"x 4' 6" Cleveland precision, (5).
12"x 5' 6" Davis tool room, (4).
12"x 4' 3" Shepard.
11"x 6' Cleveland, "Stellar", (2).
11"x 5' Hudson.
11"x 4' No. 100 Wells, speed lathe.
6"x30" Dalton bench lathe.
4"x 5' Elgin precision bench lathe.
No. 54 Sloan & Chase bench lathe.
Full line, Rivett precision bench lathes.

DRILLING MACHINES.

44' Morris plain radial.
34' Canedy-Otto radial, (3).
3' Western Manufacturing radial.
36" Snyder traveling head.
32" Cleveland sliding head, (3).
28" Cleveland sliding head, (3).
25" Cleveland, upright.
25" Silver sliding head.
23" Snyder upright (8).
224" Cleveland upright, (5).
21" Cleveland upright, (9).

20" Canedy-Otto, upright, (6).
20" Wisconsin, all-g geared.
20" Milwaukee, lever feed (2).
20" Silver, wheel and lever feed.
Nos. 1, 2 & 3 spdl. Detroit, h. s., b. b.
Nos. 1, 2 & 3 spdl. Demco, h. s., b. b.
2 spindle Cleveland, h. s., b. b.
14" U. S. sensitive.
Belt driven bench.
Motor driven bench.
Portable electric.

MILLING MACHINES.

No. 2 Cleveland universal, (3).
No. 2 Cleveland, plain, (3).
No. 2-A Fox universal, (3).
No. 2-B Fox plain, (3).

Nos. 1-A, 1-B and 0-B Fox plain.
No. 0 Steptoe hand miller.
No. 1 U. S. hand miller.
No. 3 Becker standard vertical.

GRINDERS.

No. 3 Modern universal, (2).
No. 3 Wilmarth & Morman surface.
No. 2 Reid surface.
Hartford improved surface.
24" Milwaukee wet tool.
Cleveland profile.
No. 1 Norton cutter and tool.

No. 1 Grand Rapids, cutter and tool.
Grand Rapids drill—various sizes.
Yankee drill—various sizes.
5x18 Ott plain.
Partridge floor stand—various sizes.
Portable electric.
Full line Rivett precision internal.

MISCELLANEOUS.

Arbor presses, Atlas, all sizes.
Filing machine, Nos. 2 & 3 Barry.
Gear hobbars, No. 3 Farwell, (2).
Hack saws, Peerless, 6x6, 9x9 & 13x16
Hack saw, No. 1 Racine.
Planer, 36x30x8' Gorton.
Punch press, style B Rockford.
Punch press, No. 1 Rockford.
Punch and shear, No. 12 Beloit.

Punch press, No. 4 Rockford, fly-wheel.
Shaper, 18" Walcott.
Shaper, 18" Barker.
Shaper, 20" Walcott.
Shaper, 20" Milwaukee.
Shaper, 24" Milwaukee.
Shaper, 24" Barker.
Full line Pexto Tinnars' Tools.

USED MISCELLANEOUS.

Drilling and tap'g mche., Murchey.
Grinder, tool post.

Shaper, 20" Rockford.
Turret lathe, 24" Steinle.

SECOND-HAND MACHINERY

FOR SALE BY

Chas. Molitor Machinery Co., 124 S. Clinton St., Chicago, Ill.

Special Bargains.

MILLERS, SHAPERS, PLANERS.

No. 2 Cincinnati univ., vert. attach. 32"x32"x8' Betts planer.
Gray thread millers, (2). 16" Barker b. g. crank shaper.
Burr automatic key miller. 20" geared Hendey friction.

GEAR CUTTERS.

48" Gould & Eberhardt auto. 36" Gould & Eberhardt auto. (2).

TURRET LATHES.

18" Libby, full equipment, (2). 34"x4 Greenlee, (6).
3"x36" Jones & Lamson, (4). 25"x9' Acme 34".

PUNCHES AND SHEARS.

26" Niagara square shear, 3-16" cap. 36" Bertsch squ. sh. 15" gap, 12 g.
10" Niagara foot pwr. squ. sh. 18 g. No. 3 Royersford dbl. end p. & sh.
Coulter & McK. vertical bulldozer. No. 68 Bliss dbl. action press.
33" Adrian double action arch. press. No. 6 Whiting punch and shear.

GRINDERS.

Landis 18"x8' plain. Thomson 10"x48" universal.
No. 2 Oakley universal. No. 2 Greenfield universal.
Wells plain. 12"x32" Landis plain.

MISCELLANEOUS.

Broaching machines, Lapointe. (2). Drill, 10-sp. adjustable, 1" cap.
Cock grinder, 4-sp. vert. Foote-Burt. Milling and grinding mchs. vert., (2).
Drills, 23" Foote-Burt heavy. Rotary grinders, heavy, (2).

FOR SALE BY

Wm. C. Johnson & Sons Machinery Co.,

1001-3-5 N. Sixth St.,

St. Louis, Mo.

LATHES.

14"x 6' Whitcomb-Blaisdell. 21"x10' LeBlond, heavy duty.
16"x 7' Oliver q. c. gear. 22"x10' Davis q. c. gear.
18"x 8' Hamilton. 26"x10' Bridgeford q. c. gear.
18"x 8' Reed. 26"x12' Bridgeford q. c. gear.
18"x 9' Chard. 22"x22' screw cutting.
20"x 8' Lodge & Shipley. 3"x36" Jones & Lamson.

PLANERS.

24"x24"x 6' Pease. 36"x36"x12' Pond, 2 heads.
26"x26"x 5' Pease.

STEAM HAMMERS.

600 lb. Bement-Miles. 1100 lb. Bement-Miles.

POWER PRESSES.

No. 61 Bliss. No. 40 Swaine arch press.
No. 2 inclinable. No. 42 Toledo horn press.
No. 6 Niagara inclinable.

DRILLING MACHINES.

2-spindle Kern high speed. 16" Elmore high speed.
24" Henry & Wright high speed. 24" Baker Bros. heavy duty.

MILLING MACHINES.

No. 4 Becker plain. No. 3 LeBlond plain.
No. 34 Oesterlein plain. No. 38 Owen plain.
No. 2 Rockford universal. No. 24 Rockford universal.
No. 23 Becker plain.

MISCELLANEOUS

Blower, No. 3 Root. Grinder, 10"x30" Landis universal.
Bolt cutter, 14" Blakeslee. Grinder, 12"x36" Landis universal.
Bolt header, 14" Blakeslee. Punch, 24" throat Rock River, 4 in 1.
Brake, 8' steel, No. 18 capacity. Punch & sh. No. 1 L. & A., 24" tht.
Brake, 10' steel, No. 16 capacity. Punch, No. 2 Cleveland, sgl. 15" tht.
Bulldozer, No. 3 Fisher. Screw machine, P. & W., hand, 2".
Chucks, Hannifin air. Screw machines, Warner & Swasey,
Gear cutter, 26" Cincinnati. hand, 2".
Grinder, No. 38 plowshare. Stamping mche. Noble & Westbrook.

SECOND-HAND MACHINERY

FOR SALE BY

Badger-Packard Mch'y. Co., 133-139 W. Water St., Milwaukee, Wis.

LATHES

11" x 5' Seneca Falls "Star" No. 30-E, with countershaft.
12" x 6' Blaisdell, l. c. g., 4-st. c., d. g.
16" x 6' Cincinnati, q. c. g., 3-st. c., d. b. g., with c. s.
16" x 6' Prentice, l. c. g., 4-st. c., s. b. g., with equipment.
24" x 16' old type, loose change gear, 4 s. c., s. b. g.

MISCELLANEOUS

Drill, 24" Foote-Burt No. 25, high duty, agl. pulley drive.
Drill press, 24" Milwaukee, slid. hd., g. p. l., b. g.
Engine, steam, 25 h. p., center crank, with governor.
Exhauster, planing mill, No. 40 Sturtevant, slow speed.
Feed water heater, 22" x 60" Allis-Chalmers, Reynolds closed pat.
Glue heater, steam 100 gal. Advance, Wetmore.
Grinder, No. 6 Bealy disc, double, spdl., belt dr., with c. s.
Grinder, 72" Holmes auto. knife.
Grinder, 10" x 20" Landis universal with equipment.
Hammer, Star upright power, 35 lb.
Miller, No. 9 Kempamith, p. c. d., b. g.
Miller, No. 10 Kempamith, hand.

Oven furnace, No. 1 Stewart, with blower.
Oven furnace, No. 27 Stewart, without blower.
Pipe machine, 4" Armstrong, hand and power.
Planer, 24" x 24" x 16" Fitchburg.
Planer, 30" x 30" x 8" Steptoe-McFarlane, single head, with c. s.
Punch, style M Badger, rapid action, 6" throat, 3" x 31" cap.
Purifier, 30" x 16" Buffalo, closed pattern.
Rivet spinning machine, Grant, 110 v., d. c., motor driven, 3/16" cap.
Screw machine, 1 1/2" Cleveland auto.
Screw mch., 1 1/2" x 17" Hartford auto.
Steam pump, 5" x 2 1/2" x 6" Whittier duplex.

FOR SALE BY

H. D. Warner,

57 May St., Hartford, Conn.

Annealing furnace, automatic rotary.
Automatic, 1 1/2" mult-spdl. Gridley.
Automatic, 1 1/2" Cleveland.
Automatic, 1 1/2" Cleveland.
Automatic, 2 1/2" Cleveland.
Automatics, 3 1/2" Cleveland, (2).
Automatics, 6" Cleveland, (2).
Automatics, No. 23 New Britain, (6).
Automatics, 2 1/2" Gridley, (6).
Automatics, Potter & J., No. 6A, (4).
Broaching mchs., No. 1 Lapointe, (5).
Chuckling mchs., No. 33 New Britain.
Drill press, 3-spindle Allen.
Drill press, 4-spindle Norton & Jones.
Drill press, 4-spindle Barnes.
Gear cutters, 3" x 36" B. & S., (6).
Grinder, No. 2 Landis universal.
Grinders, Norton plain, 10" x 36", (2).
Hammers, Bradley helve, new, (6).
Hammer, steam, 600-lb. Niles-Bement-Pond, nearly new.
Hammer, steam, 1000-lb. Niles-Bement-Pond, nearly new.
Hammer, steam, 1200-lb. Niles-Bement-Pond, nearly new.
Hammers, board lift drop, 400-lb. Billings & Spencer, nearly new, (6).
Header, 4" Acme hot bolt.
Headers, Manville dbl. stroke, (2).
Hydraulic presses, large assortment, 200 to 2000 tons capacity.

Lathe, 2" x 24" J. & L., sliding head.
Lathe, 3" x 36" Jones & Lamson.
Lathes, Himoff plain turning, (10).
Lathes, Gisholt turret, (6).
Millers, No. 12 B. & S. plain, (2).
Millers, P. & W. Lincoln, (6).
Millers, Briggs type A, (2).
Press, No. 55 Toledo, 1" stroke.
Presses, No. 77 Bliss.
Presses, No. 60 Bliss.
Presses, No. 55 Toledo.
Press, embossing, No. 26 Bliss.
Press, embossing, No. 27-K Bliss.
Profilers, P. & W. 2-spindle, (4).
Rolling mills, various sizes for sheet brass, (7).
Screw machine, No. 3 P. & W., hand.
Screw machine, No. 4 B. & O., hand.
Screw machine, No. 6 W. & S., hand.
Screw machines, 1" Acme, hand, (2).
Screw machines, 1 1/2" Acme, hand, (2).
Screw mchs., auto., No. 55 Acme, (2).
Shear, alligator, to cut 1 1/2" square cold steel.
Slotters, 8" Newton, (2).
Spot welder, Toledo, 1/2" capacity.
Threading machines, type 2 Geometric, (4).
Threading mchs., No. 4 Manville, (6).
Tote boxes, metal, assorted sizes, (15,000).

SECOND-HAND MACHINERY

FOR SALE BY

The Burke Machine Tool Co., . . . **Conneaut, Ohio**

Gas engine, 40 h. p. tandem Elyria, in good condition, now running...	\$500.
lathes, 12" taper turning, (2) each	125.
Planer, 18x18x4' Whitcomb	250.
Saw grinder, 30" automatic	75.

FOR SALE BY

The O'Brien Machinery Co., 119 N. Third St., Philadelphia, Pa.

Boring and turning lathes, 26"x10' Walter Scott, 2-step cone, d. b. g., 5" belt: some fitted with turret on carriage, six 3" holes in turret; turning lathes swing 5' 4" between centers, 23" over carriage; price low for quick sale; photo and complete specifications on request, (12).
 Drill, 26" Barnes, all geared drive.
 Grinder, 3' Pratt & Whitney vertical circular, with magnetic chuck.
 Lathes, 26"x12' Bridgeford, heavy duty, (4).
 Lathe, 35"x18' Bement.
 Milling machine, No. 1 Dow plain.
 Milling machine, No. 2 Garvin universal.
 Milling machine, No. 3 Becker vertical.
 Punch and shear, single end, capacity 1" in 4", new.
 Punch and shear, double end, capacity 1" in 1", new.
 Radial drill, 26" Mueller plain.
 Shaper, 24" Flather, heavy duty.
 Turret lathes, No. 4 Bardons & Oliver, (2).
 Turret lathes, No. 5 Bardons & Oliver, (2).

FOR SALE BY

Cleveland Belting & Mchy. Co., 1922 Scranton Rd., Cleveland, O.

SPENCER ENGINEERING CO. MACHINERY

List of Machinery at the Spencer Engineering Co., Toledo, O.

Air chucks, with air cylinders and connections, (47).	Lathe, 48"x20' Industrial, c. r.
Air hoist, 14" diameter, 8' lift.	Lathes, turret, 18" American, d.b.g., 8' bed, (14).
Air hoists, 8" bore, 8' lift, (2).	Lathes, turret, 18" American, grd. head, 8' bed, (11).
Air tanks, with valves & gauges, (2).	Lathe, turret, 18"x8' Prentice, grd. head, with carriage.
Annealing furnaces, 8"x32" Quigley, (2).	Miller, 20" Gould & Eberhardt.
Boring machines, No. 416 Baker, latest type, (2).	Oil pump, cap. 5 gallon per minute.
Grinders, wet, Townsend, (17).	Roller marking machines, (2).
Grinding jacks, various sizes, (3).	Shell spraying machines, (2).
Hydraulic accumulator.	Shot blast machines, Gray, (3).
Hydraulic banding presses, (2).	Steel tank, 3 bbl. 42x36x30 deep.
Hydraulic pumps, (2).	Steel tank, 10 bbl., 5x6x3'4", steam jacketed.
Lathes, engine, 16" American, d.b.g., 6' bed, (22).	Thread millers, Smalley-General, equipped with air chucks, air cylinders and valves, (10).
Lathes, engine, 18" American, d.b.g., 6' bed, (21).	Tool hardening furnace.
Lathes, engine, 18" American, grd. hd., single pulley dr., 8' bed, (9).	

There is also in this plant a large quantity of pulleys, all sizes, line shafting, hangers and belting of all descriptions. Also a large stock of tool room and stock room supplies.

SECOND-HAND MACHINERY

FOR SALE BY

Farley & Loetscher Mfg. Co.,

Dubuque, Iowa

DRILL PRESSES.

16" Hoefler upright drill presses, (2).

RIVETING MACHINE.

No. 83 Grant rotary rivet spinning machine, for 3-16" rivets, bench type.

The above machines practically new, used but a few months on Government work.

FOR SALE BY

Peninsular Machinery Co., 281 E. Jefferson Ave., Detroit, Mich.

Drill, 10" Hoefler, friction disc.
Drill, 20" Rockford, back geared.
Drill, 23" Rockford, back geared.
Drill, 24" Rockford, sliding head.
Drill, 24" Fosdick radial.
Drill, Pierle high spd. ball bearing.
Grinder, No. 1 LeBlond univ. cutter.
Grinder, No. 2 Grand Rapids, drill and tool.
Grinder, No. 1 Blount, emery.
Grinder, No. 6 Blount, d. e. emery.
Groover, No. 3 Niagara.
Lathe, 11"x 4' Blount speed.
Lathe, 14"x 6' LeBlond engine.
Lathe, 16"x 6' LeBlond engine.

Lathe, 17"x 8' LeBlond rap. produc.
Lathe, 17"x 10' LeBlond automobile.
Lathe, 18"x 8' LeBlond engine.
Lathe, 18"x 8' LeBlond engine, quick change gear, motor drive.
Lathe, 20"x 10' LeBlond engine.
Lathe, 25"x 12' LeBlond engine, h. d.
Lathe, 30"x 16' Pond.
Miller, No. 24 LeBlond universal.
Miller, No. 3H LeBlond universal.
Planer, 24"x 24"x 6' Rockford, agl. hd.
Planer, 30"x 30"x 18' Rockford, 2 hds.
Planer, 54"x 54"x 30' Betts heavy pattern, reversing motor drive.

get 124-143

FOR SALE BY

W. J. Baird Machinery Co., 265 Jefferson Ave., E., Detroit, Mich.

Boring mill, No. 1 Lambert horizontal, 3" bar, new.
Boring mill, 30" Gisholt vertical, used.
Boring mill, 30" Bullard vertical, used.
Boring mill, 42" Bullard vertical, used.
Grinder, No. 1 Security internal, new.
Grinder, No. 1 Wilmarth & Morman universal, new.
Grinder, No. 3 Wilmarth & Morman surface, new.
Grinder, No. 1 Fraser universal, new.
Grinder, No. 2 Fraser universal, new.
Grinder, No. 2 Bath universal, used.
Grinders, No. 2 La Salle automatic surface, new (2).
Lathes, 14"x 6' Filsmith, double back geared, new, (2).
Lathes, 25"x 12' Sidney heavy duty, new, (2).
Lathe, 15"x 6' Crawford tool room, new.
Lathes, 16"x 8' Bradford, tool room, new, (2).
Lathes, 18"x 8' Bradford, q. c., dbl. b. g., new, (2).
Lathes, 6"x 30" type B-4 Dalton bench, new, (8).
Lathes, No. 3 Ideal precision bench, new, (4).
Lathes, No. 4 Stark precision bench, new, (2).
Milling machine, No. 3 Cincinnati vertical, new.
Milling machines, No. 2 Rockford high-powered, plain, new, (2).
Millers, No. 1 Rockford hand, new, (3).
Millers, No. 1 U. S. hand, new, (3).
Planer, 22"x 22"x 5' Wheeler, one head, used.
Planer, 48"x 48"x 14' Pond, two heads, used.
Planer, 36"x 36"x 12' American, one head, used.
Planer, 60"x 60"x 12' Pond, three heads, used.
Shaper, 20" Columbia crank, new.
Shaper, 7" No. 1 Rhodes horizontal crank, new.

Out of Screw Product Business

Selling Fifty Automatics

together with other machines
at bargain prices.

Send for complete list giving
description and prices.

You will find every machine
a real bargain.

The Toledo Screw Products Co.
Toledo, Ohio

Auction!! Auction!!

We will on

August 21, 1919—Commencing at 10 a.m.

Sell at Public Auction—Without Reserve

**The Machinery and Factory Equipment of the Manufacturing
and Jobbing House of**

The Donaldson & Fisher Mfg. Co.,

1654 Besley Court, Chicago

consisting of over

\$100,000.00

worth of Machinery, Parts, Tools and Accessories

The Donaldson & Fisher Mfg. Co. is one of the oldest and best known Machinery Houses in the country, and their plant and machinery are up-to-date in every particular.

In this plant there are Lathes from 14 "to 108" swing—Motors from $\frac{1}{4}$ h. p. to 20 h. p., both A. C. and D. C.—Drill Presses, including Sensitive and Multiple Drills, Baker Heavy Duty Drills—Grinders in different sizes and kinds—Punch Presses—Power Hammers—Riveting Hammers—Potter & Johnston Automatics—Warner & Swasey and other Turret Lathes—Bolt Cutters—Shafting, Belting, Pulleys, Hangers, etc., and a general stock of Machine Shop Supplies and Tools.

Stock will be on exhibition and can be inspected at the plant on

Monday, Tuesday and Wednesday, August 18, 19, 20.
Sale takes place on the premises, 1654 Besley Court.

**Terms of Sale, CASH. A deposit of 25% will be required
of each and every purchaser.**

For further particulars and full details of sale and stock, address

Gallant Auction Co.

Phone Wabash 1231 620 S. Wabash Av., Chicago

Re-MANUFACTURED - (ORIGINATED BY US) - MACHINE TOOLS

Real Bargains

Every Re-Manufactured machine is being offered at real bargain prices. In fact, we can sell our Re-Manufactured tools, which compare favorably with new, at prices lower than those of the ordinary used tools.

LATHES (300).

- 18"x 8' LeBlonds.
- 18"x8' Americans.
- 19"x8' LeBlonds.
- 20"x8' Americans.
- 20"x8' LeBlonds.
- 21"x8' LeBlonds.
- 23"x10' LeBlonds.
- 26"x10' LeBlonds.
- 26"x10' Americans.
- 26"x10' Bridgefords.
- 26"x12' Bridgefords.
- 32"x12' Pittsburgs.
- 34"x11' Americans, Gd. Hd.
- 34"x20' Americans, Gd. Hd.
- 40"x12' Fifeilds, Triple Gd.
- 40"x18' Fifeilds, Triple Gd.
- 40"x24' Fifeilds, Triple Gd.

RADIAL DRILLS

- 1-8' Universal.
- 1-8' Putnam.
- 1-8' Baush.
- 1-8 1/2' Baush.

MILLING MACHINES.

- 1-No. 9 Kemp Smith Plain.
- 1-No. 24 Brown & Sharpe.
- 1-No. 2 Becker-Brainard Plain.
- 1-No. 3 Brown & Sharpe Vertical.
- 1-No. 5 Becker-Brainard Plain.

GRINDERS

- 3-12"x24" Modern Plain.
- 2-12"x36" Landis Plain.
- 1-12"x42" Cincinnati.
- 1-No. 70 Heald Internal.
- 1-No. 1 1/2 Bath.
- 1-No. 22 Brown & Sharpe Internal.
- 1-Thompson 8"x48" Surface.

BORING MACHINES

- 1-30" Bullard Vertical.
- 1-52" Niles Car Wheel Borer.
- 1-Beaman & Smith Horiz. Cylinder Boring and Milling.
- 1-6" bar Sellers Cylinder Boring and Facing machine.

PLANERS

- 1-24"x24"x 6' Hamilton.
- 1-24"x24"x 6' American.
- 1-36"x36"x10' Whitcomb, 2 heads.
- 1-36"x36"x10' Cincinnati, 2 heads.
- 1-36"x36"x13' Sellers Spiral, 2 hds.
- 1-48"x48"x18' Sellers Spiral, 1 hd.
- 1-50"x30"x 8' Gray.
- 1-60"x38"x 8' Gray.
- 1-60"x38"x10' Gray.
- 1-76"x48"x18' Woodward & Powell, 2 heads.

TURRET & SCREW MCHES.

- 1-12" Foster-Kimball.
- 2-16" Pratt & Whitney.
- 1-24" Warner & Swasey Chucking.
- 1-24" Foster Turret.
- 3-24" Steinle.
- 14-No. 3-A Warner & Swaseys.

PRESSES, ETC.

- 1-36" wide Power Corrugating Roll.
- 1-96" Robinson Power Brake.
- 1-No. 2 Bethlehem Power Slitting Shear.

MISCELLANEOUS.

- 1-7 1/2" Nutter-Barnes Cold Saw.
- 1-No. 525 Newton Steel Foundry Cold Saw.
- 1-36" Gould & Eberhardt Hobber.
- 2-2 spindle Pratt & W. Profilers.

Write for our Green List describing these and many others

HILL, CLARKE & CO. OF CHICAGO
649 W. WASHINGTON BLVD., CHICAGO, ILL.

"New York's Greatest Clearing House—J. J. McCabe Lathe & Machinery Corporation"

A Great Turning Out of High Grade Machine Tools

especially interesting to Structural
Steel Builders—Bridge Shops—Boiler
—Steel Tank—Plate Plants, etc.

The shop was compelled to sell, so McCabe bought, and to save taking up the room at our Warehouses, Quick-disposal prices will turn this Machinery over right away.

- BENDING ROLLS**..... (1) 14-ft. 2-in. between housings; top roll 14-in. diam. lower rolls 10-in. diam. with motor-drive, complete with Motor and Controller, "Wickes Bros."
(2) 10-ft. 2-in. bet. housings, top roll 9½-in. diam. lower rolls 8¼-in. drop end hag. "McCabe."
(3) 8-ft. 9-in. bet. housings, rolls 12-in. diam.

**PUNCHES
AND SHEARS**.....

**NEW SINGLE-END (COMBINATION) FOR
PUNCHING OR SHEARING**

36-in. Tht., wt. 25,000 lbs. arranged for motor dr.
36-in. Tht., wt. 35,000 lbs. arranged for belt dr.
50-in. Tht., wt. 35,000 lbs. arranged for motor dr.
Punching capacity—1½-in. hole through 1-in.
Shearing capacity—1½-in. plates.
Punching Speed—50 strokes per minute.

HYDRAULIC RIVETER.....

8-ft. Gap, "Bement-Miles" with Accumulator,
Pump, Overhead Hoist, etc. Cap. 1¼-in. rivets.
Portable 19-in. gap, cylinder 12-in. x 12-in.
Capacity 1¼-in. rivets.

AIR RIVETER.....

60-in. Throat, "Hilles & Jones." Wt. 68,000 lbs.
14-in. Throat, ½-in. capacity.

HORIZONTAL PUNCH.....

VERTICAL PUNCH.....

SPLITTING SHEAR.....

HYDRAULIC PRESS.....

LATHES.....

(Never Used)

36-in. Throat, ¾-in. capacity.

About 75 tons for pressing in bushings.

36-in. Swing, 20-ft. Bed; 30-in. Swing, 16-ft. Bed.

21-in. Swing, 12-ft. Bed; 18-in. Swing, 10-ft. Bed.

All with Three-step Cone, Double Back-Gears.

Quick change.

RADIAL DRILLS.....

SHAPERS.....

(Never used)—2½—3½ & 4-ft. Arms, Spd.-box.

(Never used)—12 to 32-in. Stroke, Heavy duty.

ALSO LARGE STOCKS OF MILLING MACHINES—PLANERS—TUR. LATHES—Etc.

Get the complete list.

J. J. McCabe Lathe & Machinery Corp'n
149 Broadway **New York**

Grand Rapids Specials

Balancing machines, Rockford, bench, (6).
 Bolt cutter, 2" Acme.
 Boring mill, 34" vertical.
 Brake, No. 4 Chicago, hand.
 Compressor, 4½x5 Imperial, type 12, (2).
 Drill, 26" Sibley, sliding head.
 Drill, 10-spindle Grand Rapids multiple.
 Electric welder, No. 140 Toledo.
 Flexible shaft, No. 5 Plank.
 Furnace, No. 4 Hardinge.
 Grinder, disc, 52" Besly No. 19.
 Grinder, drill, No. 2½ Avey high speed.
 Grinder, drill, style B Yankee.

Grinder, universal, No. 2 Bath.
 Hack saw, No. 4 Monarch.
 Hammers, 100 lb. Little Giant, power, (2).
 Hammer, 250 lb. Little Giant, power.
 Lathes, 24"x8' South Bend, 36" gap, (4).
 Miller, No. 25 Becker plain.
 Miller, No. 37-B Chicago, small.
 Miller, No. 1-C Fox plain.
 Miller, No. 3 heavy, plain.
 Molding mch., portable, Arcade.
 Sand blast outfit, No. 6 Pangborn, (2).
 Shears, circle, No. 278 Waugh.

Complete list on application

McMullen Machinery Company

"Everything in shop Equipment"

Grand Rapids, Mich.

Second Hand Machinery

DRILLS.

No. 22 Demco sensitive bench, new, (6).
 Baker Bros. 18" stationary head, star lever hand and power feed.
 Moline No. 117 single spindle heavy "Hole Hog", (2).
 No. 65-D Moline rail drill, floor type, 36" rail, 8 heads, good as new.

ENGINE LATHES.

20"x 8' Blaisdell, plain rest.
 21"x10' LeBlond crankshaft lathes, good condition, (2).
 30"x10' Fifield, compound rest. [fine condition.]
 32"x16' Fay & Scott, compound rest, tur. on shears, turret tool post,

MILLING MACHINES.

No. 12 Brown & Sharpe, hand. | No. 2 Kempsmith plain.

PLANERS.

36"x36"x12' Gray, two heads, good condition.

PRESSES.

No. 52 Bliss inclinable type, with magazine attachment, (3).

TURRET LATHES AND SCREW MACHINES.

3"x36" Jones & Lamson flat turret, bar equipment.
 1" T. M. Smith screw mchs., plain hand, 1 new, 1 slightly used, (2).
 18"x6" Imperial chucking lathe, with turret.
 14" Gray turret lathes, back geared, pan, (2).

MISCELLANEOUS.

Die sinker, No. 2 Hendeey. | Shaper, 28" Steptoe, shifting belt.
 Pipe machine, 3" Stoever. | Shaper, 24" Walcott.

Marshall & Huschart Machinery Co.

17 S. Jefferson St., Chicago, Ill.

Good Used Tools

We offer the following used machine tools. Further particulars gladly given on receipt of request. We have facilities for overhauling used machinery and aim to offer only trustworthy machines.

BORING MACHINES.

- No. 2 Rochester, table type, belt driven.
No. 1 Lucas horizontal boring and milling machine.

DRILLING MACHINES.

- | | |
|---|---|
| <p>No. 1-1 spindle Avey, bench (24).
No. 1-1 spindle Avey, column (5).
2-sp. Taylor & Fenn manufacturing.
3-sp. Taylor & Fenn manufacturing.
No. D1 Colburn heavy duty (9).
37" Gould & Eberhardt, sliding head, b. g., p. f., tapping att. and compound table.</p> | <p>24" Mechanics, sliding head, back geared, power feed.
28" Snyder, sliding head, belted power feed.
4' Bickford plain radial, gear box, tapping attachment.
8' Drees plain radial, cone drive, b. g., tapping attachment.</p> |
|---|---|

GRINDERS.

- | | |
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| <p>No. 4-12x60 Landis universal.
No. 11 Landis plain.
10x48 Pratt & Whitney plain.
10x38 Norton plain, (3).
10x50 Norton plain, arranged for motor drive.
No. 2 Morse plain, about 6x30.
No. 2 B. & S. universal.
No. 2 Oakley univ. cutter and tool.
No. 34 Van Norman, water att. (2).</p> | <p>No. 70 Heald internal.
No. 75 Heald internal.
No. 11 Rivett, oscillating.
No. 6 Bryant internal.
Garrigus rotary surface (16).
Pratt & Whitney vertical surface magnetic and new rotary chucks.
No. 1 Norton cutter and tool, (2).
Blanchard belt driven high power vertical surface.</p> |
|--|--|

LATHES.

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| <p>9x12 Porter Cable, with taper and facing attachment.
14"x6' Prentice Brothers, with chuck.
14"x6' Lodge & Shipley, c. r., p. c. f. oil pan, pump and tubing.
16x6 Hendey, geared head, c. r., p. c. f., s. r., hollow spindle.
16"x8' Cincinnati, d. b. g., quick change gears.</p> | <p>18"x8' Perkins.
18"x8' Reed, c. r., p. c. f.
18x10 Robbins.
20x12 Lodge & Shipley, patent head.
30x7 Shellenbach, d. b. gear, quick change gear mechanism.
26"x12 Putnam, d. b. g., c. r.
24x12 Niles, c. r., p. c. f.
30x10 plain rest, p. c. f.</p> |
|--|--|

MILLING MACHINES.

- | | |
|---|---|
| <p>No. 14A Garvin plain, (7).
No. 14 Garvin plain, (4).
No. 15 Garvin plain.
No. 3 Fox plain No. 1 arbor.
No. 2 Cincinnati vertical cone drive.
No. 2 Owen plain, with new Cincinnati vise.</p> | <p>No. 11 Cincinnati plain, complete with new vises.
No. 2 Kempsmith univ. complete.
No. 11 Brown & Sharpe, complete with new Cincinnati vise.
No. 0 Steptoe plain, complete with vise.</p> |
|---|---|

SCREW MACHINES.

- | | |
|---|--|
| <p>No. 1 P. & W., wire feed.
24" Gisholt turret, 6 1/2" hole.
4 1/2" Cleveland automatic.</p> | <p>2" Cleveland automatic.
24x26 Acme flat turret, chucking equipment.</p> |
|---|--|

MISCELLANEOUS.

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| <p>Broaching mchs., No. 4 Lapointe, (2).
Planer, 42x30x10 Powell, 2 heads, t. & l. pulley, c. s.</p> | <p>Planer, 24x24x6 Putnam.
Shaper, 20" Hendey.</p> |
|--|--|

Henry Prentiss & Company

Incorporated

149 Broadway

New York

Are You Getting the Kind of Used Equipment You Are Paying For?

Our Second Hand Offerings Are Famous For Their Excellence

LATHES.

Dexter 11"x4', actual swing 12". LeBlond 16"x10', with chuck.
Lodge & Shipley 14"x5', Q. C. G. Fay & S. 18"x8', actual sw. 21".

PLANERS.

Whitcomb 17" Crank, with 11" Planer Shoe.
Whitcomb 24"x24"x7' 6", complete with countershaft.
Whitcomb 24"x24"x8', Second Belt Drive.
Pratt & Whitney 52"x52"x20', two heads on rail.

MILLING MACHINES.

Becker No. 25 Bk. Geared Plain. Brown & S. No. 7 Pl., 47" table.
Becker No. 4-B Vertical, equal Rockford No. 3 Hand, with vertical attachment.
to new.

GRINDERS.

Norton No. 1 Plain, Disc Grinding attachment. Brown & Sharpe No. 3, Cutter and Reamer.
Capitol, Internal. Fraser No. 1 Universal 8"x20".

MISCELLANEOUS.

H. & R. 2" Cutting-off machine. Rand Duplex Air Compressor
Barnes No. 2 Horizontal Radial 13"x26"x20"
Drill. Fossdick 5' Full Univ. Radial.

**LYND-FARQUHAR COMPANY, Quality Machine Tools
BOSTON, MASS.**

Machine Tools Immediately Available

One Kempsmith No. 3 Universal Miller, new.
One Kempsmith No. 3 Plain Miller, new.
One Chandler Planer 36"x12', two heads, used.
One Reed-Prentice 4' speed box Radial Drill, used.
One No. 4-B Becker Vertical Miller, used.
One No. 5 Universal Becker Vertical Miller, used.
One Pratt & Whitney 2"x26" Turret Lathe.
One Bath Universal Grinder No. 2, 10"x24".
One Fraser Universal Grinder, with complete equip., practically new.
One Flather 42x48x14' Planer, with two rail heads, one side head.
One Bullard Vertical Boring and Turning Mill, 78" swing, two heads.
One Reed Lathe, 24" swing, 20' bed, with compound rest.

Factory & Mill Supply Co.
137 Oliver St., Boston, Mass.

Back To Pre-War Prices!

Lathes

Five (5) Fay Automatic Lathes.
 50"x20' Pond, triple geared, face plate drive, etc.
 52"x24' Wood Light, triple geared, face plate drive.
 38"x14' Fay & Scott, heavy duty.
 32"x18' LeBlond, heavy type.
 20"x 8' Lodge & Shipley, geared head, pan bed.
 16"x 8' Reed Prentice, quick change, etc. New.

Hammers

1500-lb. Bliss, board top.
 250-lb. Mesta Steam Hydraulic Quick Acting Forging Press.
 1500-lb. United Engineering Co.'s Board Drop.
 800-lb. Merrill, board drop.
 300-lb. Bradley Helve.
 100-lb. Bradley Helve.
 80-lb. Yeakley, Pneumatic.

Vertical Boring Mills

14' Standard, 2 swivel heads.	90" Pond, 2 swivel heads.
10' Hilles & Jones single head.	72" Bement, single head.
60" Niles-Bement-Pond, 2 swivel heads—heavy, latest.	38" Baush, 2 swivel heads.
	38" Bullard, 2 swivel heads.

Radial Drills

6' Baush, practically new.	5' Baush, motor driven.
6' Bickford, semi-universal.	3½' Gang, tapping.

Planers

60"x48"x20' Gleason, 3 heads.	42"x42"x12' Pond, 2 heads.
48"x36"x16' Detrick & Harvey, open side, 3 heads.	30"x30"x 6' Gray, 3 heads.
48"x36"x10' Ohio, 2 heads.	30"x30"x14' Flather, 2 heads.

Punches and Shears

No. 7 Hilles & Jones Multiple Punch, weight approximately 50,000 lbs.
 Thos. Carlin Alligator Shear, 12" blade, capacity 1½" rounds.
 Betts Punch, 20" gap, capacity 1" through 1½".
 Cleveland Punch, 19" gap, capacity 1" through 1½".
 Henry Pels Coping Machine, armor plate, capacity 10" beam.
 325-Ton Watson & Stillman Hydraulic Straightening Press.
 Bement Horizontal Punch, 60" gap, main gear 72"x7"; weight about 30,000 lbs.

Multiple Drills

Bickford, 10 Spindle Rail Drill, 2" capacity, heavy.
 Two Spindle Foote-Burt, heavy duty.
 Five Spindle Baush, capacity 1½".
 16-Spindle Baush, capacity 1".

Presses

No. 512 Bliss.
 Four (4) No. 540 Max Ams, geared 8" stroke.
 No. 1 Bliss, straight side, 14" stroke.
 No. 1 Farrel Arch, single crank, 10" stroke.
 No. 6 Farrel, straight side, geared, 8" stroke.
 No. 5 Farrel, straight side, geared, 8" stroke.
 No. 2 Bliss, 7" stroke.
 And 40 Other Presses.

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THE MOTT & MERRYWEATHER MACHINERY CO

707-715 Lakeside Ave., N. W., Cleveland, Ohio
BRANCHES: DETROIT, CINCINNATI, PITTSBURGH

Practically New and at Pre-War Prices. Surplus Equipment of the
Lincoln Motor Co., Manufacturer of Liberty Airplane Motors

GRINDERS.

- 6 No. 18 Bryant Internal.
- 6 No. 1½ Cincinnati Cutter and Tool.
- 6 4-spindle Foote-Burt Valve.
- 12 No. 60 Heald Cylinder.
- 3 12x24" Modern Plain.
- 6 10x50" Norton Plain.

MILLING MACHINES.

- 7 Type "A" Briggs.
- 6 10" Pratt & Whitney Automatic.
- 6 No. 15 Garvin Plain.
- 1 No. 22 Garvin Vertical.
- 2 2" Pratt & Whitney Spline.

BROACHING MACHINES.

- 2 No. 0 J. N. Lapointe.

LATHES.

- 3 9"x12" Sundstrand Mfg.
- 4 16"x10" Rahn-Larmon Standard.
- 1 16"x10" Rahn-Larmon Standard.
- 10 21"x10" South Bend.
- 3 24"x10" Lodge & Shipley, Selective Hd.

SCREW MACHINES.

- 2 No. 2 Smurr & Kamen 2" capacity.

TURRET LATHES.

- 6 2¼"x26" Cincinnati Acme Plain.

7 Type "A" Briggs.
 6 10" Pratt & Whitney Automatic.
 2 No. 2 Smurr & Kamen 2" capacity.

- 6 No. 15 Garvin Plain.
 1 No. 22 Garvin Vertical.
 2 2" Pratt & Whitney Spline.
 10 No. 6 Whitney Hand.

TURRET LATHES.

- 6 2½"x26" Cincinnati Acme Plain.
 10 3¼"x36" Cincinnati Acme plain.

Few Additional Machines Here in our Used Machinery Dept.

BORING MILLS.

- 1 36" Bullard Vertical Turret Lathe.

GRINDERS.

- 1 26" Blanchard Vertical Floor M. D.
 5 No. 18 Bryant Chucking Grinders.
 2 Garrigus Ring.
 3 14x72 Norton Plain Grinders.
 5 16x72 Norton Double Head Pin.
 1 12x96 Landis Plain.
 3 No. 60 Heald Cylinder Grinders.
 3 No. 1½ Landis Grinders.
 5 No. 205 Rivett Hand Oscillating.

LATHES.

- 1 16"x 8' Monarch.
 2 20"x 8' Bradford.
 1 22"x14' Niles.
 1 30"x14' Pond.
 2 30"x18' American.
 2 9"x12' Sunstrand.
 1 16" double head Greaves & Klusman.
 4 21"x10' South Bend, (new).

GEAR CUTTERS.

- 1 No. 3-26" Brown & Sharpe.
 2 36"x9" Gould & Eberhardt Horiz. Type.
 1 No. 2 Whiton Automatic.

AUTOMATIC MILLERS.

- 2 10" Pratt & Whitney.

PISTON RING MACHINES.

- 3 Plain Gridleys.
 2 Eccentric Gridleys.
 2 No. 2-P Potter & Johnston, (plain).
 2 No. 2-P Potter & Johnston, (eccentric).

TURRET LATHES & SCREW MCHS.

- 6 3¼"x36" Acme.
 4 2¼"x26" Acme.
 1 No. 7 Bardons & Oliver.
 1 ¾"x½" Plain Cleveland.
 1 2" Cleveland.
 1 1"x7" Acme.

Look Over This Exceptional List

First Class Machine Tools

Immediate Delivery

- 1-33"x33"x10' Knecht (Bickett) Planer, 4 heads.
- 1-36"x36"x12' Gray Planer, 4 heads.
- 1-36"x36"x24' Pond Planer, double head.
- 1-37' American Vertical Boring Mill, 2 heads.
- 1-No. 1 Cleveland Horizontal Mill, 2½' bar.
- 1-Warner & Swasey Horizontal Mill, 2½' bar.
- 1-38"x20' New Haven Engine Lathe, c. r.
- 1-Heavy Beveling Shear, capacity ¾" plate.
- 1-350 ton Niles Hydraulic Wheel Press, 84" capacity.

RADIAL DRILLS.

- 38" Druses g. b. drive.
- 1-6' Niles plain, motor drive, \$1450.
- 1-5' Niles plain, \$450.
- 1-4½' Bickford, g. b. drive, \$1250.
- 1-Heavy duty Baker drill, g. b. drive, Style 2 M.

AUTO. TURRET LATHES.

- 1-3" P. & W., geared head.
- 2-2x34 J. & L., geared heads.
- 1-3x36 J. & L., geared heads.
- 1-2"x24 Pratt & Whitney, grd. hds.
- 1-2" Cleveland automatic, 5 hole.
- 1-14" W. & S. Turret.
- 2-Hand screw machines, 1" cap.

AIR COMPRESSORS.

- 1-13"x8"x12" Curtis vert. dbl. cyl.
- 1-No. 0 Auto garage compressor.
- 1-12"x10" Ingersoll-Rand.

SHAPERS.

- 1-18" Hollingsworth, b. g. crank.
- 1-24" open side.
- 1-24" Barker, b. g. crank.
- 1-24" Cincinnati, b. g. crank.

GRINDERS.

- 1-No. 70 Heald, internal.
- 2-10"x30" Landis, plain.
- 1-6"x48" Pratt & Whitney, plain.
- 1-12"x32" Landis, plain.
- 1-12"x24" Modern grinder.
- 1-10"x24" Landis, plain.
- 1-14" P. & W. vert. surface grinder.

MILLING MACHINES.

- 1-No. 1½ Valley City universal.
- 1-No. 42 Oesterlein plain.
- 1-No. 4 Cincinnati plain.
- 1-No. 1½ Oesterlein universal.
- 1-No. 3 Cin'ti plain, s. p. drive.
- 1-No. 4 Cincinnati vert., s. p. drive.
- 1-No. 1 Y Brown & Sharpe.
- 1-No. 10 Pratt & Whitney, hand.
- 2-No. 0 Owen plain, new.

ENGINE LATHES.

- 1-13"x5'6" Carroll-Jamison, s. q. c.
- 1-17"x8' Greaves-Klusman.
- 1-20"x8' Lodge & Shipley, qck. ch.
- 12-17"x8' National, quick change.
- 6-18"x8' Milwaukee, semi qck. ch.
- 2-18"x10' Chard, semi qck. change.
- 1-38"x20' New Haven.
- 6-18"x8' Lodge & Shipley, grd. hds.
- 3-21"x10' LeBlond, heavy duty.
- 2-25"x10' LeBlond, heavy duty.

GEAR CUTTERS AND HOBBERS.

- 1-48" No. 4 Brown & Sharpe auto.
- 1-No. 6 Lees Bradner auto.
- 1-36" No. 4 Cincinnati auto.
- 1-24" Schuchardt & Schutte.
- No. 3 Brown & Sharpe, 26" capacity.

MULTIPLE DRILLS.

- 1-4 Spindle Barnes, 22", b. g. & p. f.
- 1-4 Spindle Barnes sensitive.
- 1-3 Spindle sen., Taylor & Fenn.
- 1-No. 4 32-spindle Fox.
- 6-24" Drills, single head.
- 1-40" Cincinnati, tapping attach.

WRITE-WIRE-PHONE

Broadway Machinery Company
236-238 Broadway - - - Cincinnati, Ohio

Our Guarantee

Money Back if Not Satisfied

Pipe Machines

- 1—No. 306-B Oster Pipe Machine, capacity $1\frac{1}{2}$ " to 6"; arranged for motor dr.
- 1—Williams No. 1 Pipe Machine; capacity $\frac{1}{2}$ " to 2"
- 1—No. 38 Forbes Hand Machine; capacity $1\frac{1}{2}$ " to 4".

Grinders

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- 1—No. 2-B Rockford Universal Milling Machine, (new).
- 2—No. 0 Bickett Vertical Profilers and Millers.
- 2—U. S. Hand Millers.
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- 1—No. 2 American Plain Miller.

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Ritchie Werts Co. Dayton, Ohio

Bench Legs, Steel

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Lewthwaite Co. Geo. A. 116 Walker St., N. Y.
Lourie Mfg. Co. Springfield, Ill.
Pedrick Tool & Machine Co. Philadelphia
Underwood Corp. H. B. Philadelphia

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Wickes Bros. Saginaw, Mich.

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Kelly Reamer Co. Cleveland
Madison Mfg. Co. Muskegon, Mich.
Pedrick Tool & Machine Co. Philadelphia
Ready Tool Co. Bridgeport, Conn.
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Becker Milling Machine Co. Boston
Giddings & Lewis Mfg. Co. Fond du Lac, Wis.
Pawling & Harnischfeger Co., Milwaukee
Schipper Machine & Tool Co. Aurora, Ind.
Simmons Machine Co. Albany, N. Y.

Boring Heads

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Waterson, J. M., Detroit, Mich.

Boring Machines, Cylinder

Barrett Mch. Tool Co. Meadville, Pa.

Boring Machines, Horizontal

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Pedrick Tool & Machine Co., Philadelphia
Rockford Drilling Machine Co., Rockford, Ill.

Boring and Turning Machines, Vertical

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Newman Mfg. Co., Cincinnati

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Wood Turret Machine Co., Brazil, Ind.

Chucks, Centering

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Thomas Elevator Co., 31 S. Hoyne Ave., Chicago

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Hoskisson & Pettis Mfg. Co., New Haven, Conn.
Newman Mfg. Co., Cincinnati
Sidney Tool Co., Sidney, Ohio
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Chucks, Magnetic

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Heald Machine Co., Worcester, Mass.

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Jones Superior Machine Co., 1294 W. North
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Milwaukee Shaper Co., Milwaukee, Wis.
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Cochrane Bly Co., Rochester, N. Y.
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New Britain Machine Co., New Britain, Conn.
Robbins, Gamwell & Co., Pittsfield, Mass.
Stober Machine Co., Utica, N. Y.

Couplings, Friction Clutch

Conway & Co., Cincinnati

Cranes, Hand Power

Euclid Crane & Hoist Co., Euclid, Ohio
Fawling & Harnischfeger Co., Milwaukee, Wis.
Weaver Mfg. Co., Springfield, Ill.

Cranes, Portable

Candey Otto Mfg. Co., Chicago Heights, Ill.
Canton Foundry & Mfg. Co., Canton, Ohio
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Euclid Crane & Hoist Co., Euclid, Ohio
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Underwood Corp., H. B., Philadelphia

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Clough, R. M., Meriden, Conn.
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Greenfield Tap & Die Corp., Greenfield, Mass.

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Greenfield Tap & Die Corp., Greenfield, Mass.
Hardinge Brothers, 1770 Berteau Av., Chicago
National Acme Co., Cleveland

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Modern Tool Co., Erie, Pa.
Murchey Mche & Tool Co., Detroit, Mich.
Rickert-Shafer Co., Erie, Pa.

Dogs, Machine

Ready Tool Co., Bridgeport, Conn.

Drilling Machine Heads

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Newman Mfg. Co., Cincinnati
Rockford Drilling Machine Co., Rockford, Ill.
Sellew Machine Tool Co., Pawtucket, R. I.
Spafford Tool Works, Hartford, Conn.

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Cincinnati Pulley Machinery Co., Cincinnati
Demco Machine Tool Co., Cleveland
High Speed Hammer Co., Rochester, N. Y.
Reed Co., Francis, Worcester, Mass.
Rockford Drilling Mche Co., Rockford, Ill.
Taylor & Fenn Co., Hartford, Conn.

Drilling Machines, Horizontal

Fawling & Harnischfeger Co., Milwaukee, Wis.
Rockford Drilling Mche Co., Rockford, Ill.

Drilling Machines, Multiple Spindle

Cincinnati Pulley Machinery Co., Cincinnati
Demco Machine Tool Co., Cleveland, N. Y.
Edlund Machinery Co., Inc., Cortland, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.
National Acme Co., Cleveland
Reed Co., Francis, Worcester, Mass.
Rockford Drilling Mche Co., Rockford, Ill.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.

Drilling Machines, Portable Electric

Independent Pneumatic Tool Co., 600 W.
Jackson Blvd., Chicago
Stow Flexible Shaft Co., Philadelphia
Van Dorn Electric Tool Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Drilling Machines, Post

Candey Otto Mfg. Co., Chicago Heights, Ill.
Hammond Mfg. Co., Cleveland, Ohio
Henry & Wright Mfg. Co., Hartford, Conn.
Mueler Machine Tool Co., Cincinnati
Silver Mfg. Co., Salem, Ohio

Drilling Machines, Radial

Candey Otto Mfg. Co., Chicago Heights, Ill.
Hammond Mfg. Co., Cleveland
Henry & Wright Mfg. Co., Hartford, Conn.
Mueler Machine Tool Co., Cincinnati
Fawling & Harnischfeger Co., Milwaukee, Wis.
Silver Mfg. Co., Salem, Ohio
Taylor & Fenn Co., Hartford, Conn.
Sipp Machine Co., Paterson, N. J.
Wickes Bros., Saginaw, Mich.

Drilling Machines, Sensitive

Harks Machine Tool Co., Conneaut, Ohio
Candey Otto Mfg. Co., Chicago Heights, Ill.
Cincinnati Pulley Machinery Co., Cincinnati
Demco Machine Tool Co., Cleveland
Edlund Machinery Co., Inc., Cortland, N. Y.
Fenn Mfg. Co., Hartford, Conn.
Hardinge Brothers, 1770 Berteau Av., Chicago
Henry & Wright Mfg. Co., Hartford, Conn.
Reed Co., Francis, Worcester, Mass.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.
Wisconsin Electric Co., Racine, Wis.

Drilling, Milling and Boring Machines, Vertical

Aurora Tool Works, Aurora, Ind.
Knight Machinery Co., W. B., St. Louis, Mo.

Classified Finding Index

Drilling Machines, Vertical

Aurora Tool Works, Aurora, Ind.
Canedy Otto Mfg. Co., Chicago Heights, Ill.
Cincinnati Pulley Machinery Co., Cincinnati
Davis Machine Tool Co., Rochester, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.
Hinckley Machine Works, Hinckley, Ill.
Rockford Drilling Machine Co., Rockford, Ill.
Silver Mfg. Co., Salem, Ohio
Sipp Machine Co., Paterson, N. J.
Taylor & Penn Co., Hartford, Conn.

Drilling and Tapping Attachments

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Demco Machine Tool Co., Cleveland
Henry & Wright Mfg. Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Newman Mfg. Co., Cincinnati
Reed Co., Francis, Worcester, Mass.
Schipper Machine & Tool Co., Aurora, Ind.
Sipp Machine Co., Paterson, N. J.
Turner Machine Co., Danbury, Conn.

Drills, Pneumatic

Independent Pneumatic Tool Co., 600 W.
Jackson Blvd., Chicago

Drills, Twist

Sterling Products Co., 549 Washington Blvd.,
Chicago

Dust Handling Equipment

Knickerbocker Co., Jackson, Mich.

Emery Stands

Blount Co., J. G., Everett, Mass.
Buchanan Co., Thos., Cincinnati
Carroll Mfg. Co., L. W., Batavia, Ohio
Partridge, E. O., 2047 W. Lake St., Chicago

Emery Wheel Dressers and Cutters

Buchanan Co., Thos., Cincinnati
Taylor & Penn Co., Hartford, Conn.

Feed Gear, for Turret Lathes

Wiggins & Co., A. V., Syracuse, N. Y.

Feeders, Oil and Soda Water

New Britain Machine Co., New Britain, Conn.

Filing Machines, Die

Cochrane-Bly Co., Rochester, N. Y.

Flexible Shafts

Stow Flexible Shaft Co., Philadelphia, Pa.

Forges

Canedy Otto Mfg. Co., Chicago Heights, Ill.

Furnaces

Bennett Co., W. R., Elmwood, Conn.

Furniture, Machine Shop

New Britain Machine Co., New Britain, Conn.

Gauges, Amplifying, Snap and Plug

North Side Tool Co., Dayton, Ohio

Gauges, Taper

Hartford Special Mch. Co., Hartford, Conn.
Way Co., A. F., Hartford, Conn.

Gauging Machines

Davis Tool Co., Cleveland, Ohio
North Side Tool Co., Dayton, Ohio

Gear Cutting Machines

Brown & Sharpe Mfg. Co., Providence, R. I.
Jones Superior Mch. Co., 1284 W. North Av.,
Chicago

Grinding Machines, Bench

Blount Co., J. G., Everett, Mass.
Carroll Mfg. Co., L. W., Batavia, Ohio
Partridge, E. O., 2047 W. Lake St., Chicago
Webster & Perks Tool Co., Springfield, Ohio

Grinding Machines, Cutter, Reamer and Tool

Blount Co., J. G., Everett, Mass.
Clough, R. M., Meriden, Conn.
Grand Rapids Grinding Machine Co., Grand
Rapids, Mich.
Greenfield Machine Co., Greenfield, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.
McDonough Mfg. Co., Eau Claire, Wis.
Manhattan Machine & Tool Works, Grand
Rapids, Mich.

National Acme Co., Cleveland
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Norman Co., Grand Rapids, Mich.

Grinding Machines, Cylindrical

Heald Machine Co., Worcester, Mass.
Whitney & Son, Baxter D., Winchendon, Mass.

Grinding Machines, Cylindrical

Brown & Sharpe Mfg. Co., Providence, R. I.
Greenfield Machine Co., Greenfield, Mass.
McDonough Mfg. Co., Eau Claire, Wis.
Manhattan Machine & Tool Works, Grand
Rapids, Mich.
Ott Grinder Co., Indianapolis, Ind.
Schmidt Co., H. L., Davenport, Iowa
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Webster & Perks Tool Co., Springfield, Ohio

Grinding Machines, Die

Abrasive Mch. Tool Co., E. Providence, R. I.
Manhattan Machine & Tool Works, Grand
Rapids, Mich.
Reed Bros. Co., Inc., Beverly, Mass.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Norman Co., Grand Rapids, Mich.

Grinding Machines, Disc

Sellow Machine Tool Co., Pawtucket, R. I.

Grinding Machines, Drill

Grand Rapids Grinding Machine Co., Grand
Rapids, Mich.
La Salle Tool Co., La Salle, Ill.
Wilmarth & Norman Co., Grand Rapids, Mich.

Grinding Machines, Face

Taylor & Penn Co., Hartford, Conn.
Thompson Grinder Co., Springfield, Ohio

Grinding Machines, Gage

Abrasive Mch. Tool Co., E. Providence, R. I.

Grinding Machines, Internal

Dalton Mfg. Corp., 1911 Park Av., New York
Heald Machine Co., Worcester, Mass.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Taylor & Penn Co., Hartford, Conn.
Thompson Grinder Co., Springfield, Ohio
Whitney & Son, Baxter D., Winchendon, Mass.
Wilmarth & Norman Co., Grand Rapids, Mich.

Grinding Machines, Portable

Independent Pneumatic Tool Co., 600 W.
Jackson Blvd., Chicago
Stow Flexible Shaft Co., Philadelphia
Strand & Co., N. A., 625 W. Jackson Blvd.,
Chicago
Van Dorn Electric Tool Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Grinding Machines, Snagging

Grand Rapids Grinding Machine Co., Grand
Rapids, Mich.
Manhattan Machine & Tool Works, Grand
Rapids, Mich.

Grinding Machines, Surface

Abrasive Mch. Tool Co., E. Providence, R. I.
Bristol Machine Tool Co., Bristol, Conn.
Cady Co., C. N., Canastota, N. Y.
Heald Machine Co., Worcester, Mass.
La Salle Tool Co., La Salle, Ill.
Reid Brothers Co., Inc., Beverly, Mass.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Norman Co., Grand Rapids, Mich.

Grinding Machines, Universal

Brown & Sharpe Mfg. Co., Providence, R. I.
Grand Rapids Grinding Machine Co., Grand
Rapids, Mich.
Greenfield Machine Co., Greenfield, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.
McDonough Mfg. Co., Eau Claire, Wis.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Webster & Perks Tool Co., Springfield, Ohio
Wilmarth & Norman Co., Grand Rapids, Mich.

Classified Finding Index

Hack Saw Blades

Racine Tool & Machine Co., Racine, Wis.
Sterling Products Co., 549 Washington Blvd.,
Chicago

Hack Saw Machines

Armstrong-Blum Mfg. Co., 341 N. Francisco
Av., Chicago
Peerless Machine Co., Racine, Wis.
Racine Tool & Machine Co., Racine, Wis.
Sterling Products Co., 549 Washington Blvd.,
Chicago

Hammers, Belt and Motor Driven

Barr H. Edall, Erie, Pa.
Beaudry & Co., Boston, Mass.
High Speed Hammer Co., Rochester, N. Y.
Quickwork Co., St. Marys, Ohio
United Hammer Co., Easton, Mass.

Hammers, Riveting

High Speed Hammer Co., Rochester, N. Y.

Handles, Machine

Cincinnati Ball Crank Co., Cincinnati

Heads, Dividing

Dickow, Fred C., 168 W. Lake St., Chicago
Simmons Machine Co., Albany, N. Y.
Stephens Co., John, Cincinnati
Willard Press & Tool Co., Cincinnati

Hobbs

Michigan Tool Co., Detroit, Mich.

Hobbing Machines

Jones Superior Machine Co., 1258 W. North
Ave., Chicago

Hoists, Air

Independent Pneumatic Tool Co., 690 W.
Jackson Blvd., Chicago

Hoists, Electric

Euclid Crane & Hoist Co., Euclid, Ohio
Thomas Elevator Co., 31 S. Hoyne Ave.,
Chicago

Weaver Mfg. Co., Springfield, Ill.

Hoists, Electric Traveling

Euclid Crane & Hoist Co., Euclid, Ohio
Fawling & Harnischfeger Co., Milwaukee, Wis.

Hoists, Portable

Canton Foundry & Machine Co., Canton, Ohio

Jigs, Fixtures, Tools, Etc.

Craftsman Tool Co., Conneaut, Ohio
Hartford Special Mch. Co., Hartford, Conn.
Hinckley Machine Works, Hinckley, Ill.
Lee Co., Frank H., Danbury, Conn.
Nestor Mfg. Co., 40 W. 13th St., New York
North Side Tool Co., Dayton, Ohio
Spafford Tool Works, Hartford, Conn.
Unity Mfg. Co., Cleveland
Way Co., A. F., Hartford, Conn.
Whiting & Comstock, Hartford, Conn.
Wiggins & Co., A. V., Syracuse, N. Y.

Joints, Universal

Ainala Mch. & Tool Works, Hartford, Conn.

Keyseating Machines

Chattanooga Mch. Co., Chattanooga, Tenn.
Davis Machine Tool Co., Rochester, N. Y.
Lapointe Co., J. N., New London, Conn.
National Machine Tool Co., Cincinnati
Racine Tool & Machine Co., Racine, Wis.
Whitney Mfg. Co., Hartford, Conn.

Lathe Accessories and Attachments

Dalton Mfg. Corp., 1911 Park Av., New York
Greaves-Klusman Tool Co., Cincinnati
Jones Superior Machine Co., 1258 W. North
Ave., Chicago
McCroaky Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Sidney Tool Co., Sidney, Ohio
Simmons Machine Co., Albany, N. Y.
South Bend Lathe Works, South Bend, Ind.

Lathes, Bench

Blount Co., J. G., Everett, Mass.
Dalton Mfg. Corp., 1911 Park Av., New York
Greenfield Tap & Die Corp., Greenfield, Mass.
Hardinge Brothers, 1770 Berneau Av., Chicago
South Bend Lathe Works, South Bend, Ind.

Lathes, Engine

Candey-Otto Mfg. Co., Chicago Heights, Ill.
Chard Lathe Co., Newcastle, Ind.
Crawford Machine Tool Co., Inc., 21 Park
Row, New York
Davis Machine Tool Co., Rochester, N. Y.
Dalton Mfg. Corp., 1911 Park Av., New York
Greaves-Klusman Tool Co., Cincinnati
Monarch Machine Tool Co., Sidney, Ohio
Mueller Machine Tool Co., Cincinnati
Sidney Tool Co., Sidney, Ohio
Smith Mfg. Co., Philip, Sidney, Ohio
South Bend Lathe Works, South Bend, Ind.
Willard Machine Tool Co., Cincinnati
Worcester Lathe Co., Worcester, Mass.
Wickes Bros., Saginaw, Mich.

Lathes, Flat Turret

Acme Machine Tool Co., Cincinnati

Lathes, Foot Power

Dalton Mfg. Corp., 1911 Park Av., New York

Lathes, Horizontal Turret

Acme Machine Tool Co., Cincinnati
Chard Lathe Co., Newcastle, Ind.
Davis Machine Tool Co., Rochester, N. Y.
Smurr & Kamen Co., 328 N. Albany Av.,
Chicago
Heinke Turret Machine Co., Madison, Wis.
Wood Turret Machine Co., Brazil, Ind.

Lathes, Short Cut

Adams Mfg. Co., O. R., Rochester, N. Y.
Sidney Tool Co., Sidney, Ohio

Lathes, Speed and Hand

Blount Co., J. G., Everett, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.

Lathes, Tilted Turret

Wood Turret Machine Co., Brazil, Ind.

Lockers, Shelving and Cupboards, Steel

Terrell's Equipment Co., Grand Rapids, Mich.

Mandrels, Expanding

Albert Tool Co., Philadelphia
Nicholson & Co., W. H., Wilkes-Barre, Pa.

Mandrels, Solid

Nicholson & Co., W. H., Wilkes-Barre, Pa.

Marking Devices, Electric

Electro-Stylograph Co., 17 Madison Av.,
New York

Metal Cutting Machines, Sheet

Racine Tool & Machine Co., Racine, Wis.
Savage Co., W. J., Knoxville, Tenn.
Way Co., A. F., Hartford, Conn.

Milling Attachments

Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Hinckley Machine Works, Hinckley, Ill.
Knight Machinery Co., W. B., St. Louis, Mo.
Stephens Co., John, Cincinnati
Whiting & Comstock, Hartford, Conn.
Willard Press & Tool Co., Cincinnati

Milling Machines, Automatic

Becker Milling Machine Co., Boston, Mass.

Milling Machines, Bench

Bickett Machine & Mfg. Co., Cincinnati
Burke Machine Tool Co., Conneaut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Hardinge Brothers, 1770 Berneau Av., Chicago
Simmons Machine Co., Albany, N. Y.

Milling Machines, Hand

Bristol Machine Tool Co., Bristol, Conn.
Burke Machine Tool Co., Conneaut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Davenport Mfg. Co., Meadville, Pa.
Stephens Co., John, Cincinnati
Whitney Mfg. Co., Hartford, Conn.

Milling Machines, Horizontal

Beaman & Smith Co., Providence, R. I.
Becker Milling Machine Co., Boston, Mass.
Gooler & Edlund, Cortland, N. Y.
Stephens Co., John, Cincinnati

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Milling Machines, Plain

Beaman & Smith Co., Providence, R. I.
Becker Milling Machine Co., Boston, Mass.
Bickett Machine & Mfg. Co., Cincinnati
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Cochrane-Bly Co., Rochester, N. Y.
Davenport Mfg. Co., Mendville, Pa.
Gooley & Edmond, Cortland, N. Y.
Stapton Co., John, Cincinnati

Milling Machines, Portable

Fedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Milling Machines, Universal

Becker Milling Machine Co., Boston, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Cochrane-Bly Co., Rochester, N. Y.
Stapton Co., John, Cincinnati

Milling Machines, Vertical

Beaman & Smith Co., Providence, R. I.
Becker Milling Machine Co., Boston, Mass.
Bickett Machine & Mfg. Co., Cincinnati
Bristol Machine Tool Co., Bristol, Conn.
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Clough, R. M., Meriden, Conn.
Cochrane-Bly Co., Rochester, N. Y.
Knight Machinery Co., W. B., St. Louis, Mo.
Taylor & Fenn Co., Hartford, Conn.

Mills, Adjustable Hollow

Genesee Mfg. Co., Rochester, N. Y.

Motors, Electric

Reliance Electric & Eng. Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Oil Cups

Gits Bros. Mfg. Co., 1940 S. Kilbourne Av., Chicago
Tucker, W. C. & F. C., Hartford, Conn.

Oil Hole Covers

Tucker, W. C. & F. C., Hartford, Conn.

Oils, Quenching

Bell & Gossett Co., 613 W. 30th St., Chicago

Pattern Shop Machinery

Chicago Mch. Exchange, 1219 Washington Blvd., Chicago
Cochrane-Bly Co., Rochester, N. Y.
Jones Superior Machine Co., 1264 W. North Av., Chicago
Silver Mfg. Co., Salem, Ohio
Towsley Mfg. Co., John T., Cincinnati

Pipe Bending Machines

Fedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Pipe Cutting and Threading Machines

Blamall & Keeler Mch. Wks., Edwardsville, Ill.
Simmons Machine Co., Albany, N. Y.

Planer Attachment, Radius

Underwood Corp., H. B., Philadelphia

Planer Tools, Circular

Underwood Corp., H. B., Philadelphia

Planers, Valve Seat, Portable

Fedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Planing Machines, Metal

Bickett Machine & Mfg. Co., Cincinnati
Cincinnati Planer Co., Cincinnati
Lee Co., Frank H., Danbury, Conn.

Pneumatic Tools

Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago

Polishing and Buffing Machines

Blount Co., J. G., Everett, Mass.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
New Britain Machine Co., New Britain, Conn.
Partridge, E. O., 2047 W. Lake St., Chicago
Stow Flexible Shaft Co., Philadelphia
Webster & Perks Tool Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Wis.
Wisconsin Electric Co., Racine, Wis. [Mich.]

Presses, Arbor

Atlas Press Co., Kalamazoo, Mich.
Bartlett, Edwin E., Nashua, N. H.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Lourie Mfg. Co., Springfield, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Weaver Mfg. Co., Springfield, Ill.

Presses, Broaching

Atlas Press Co., Kalamazoo, Mich.
Bartlett, Edwin E., Nashua, N. H.
Lourie Mfg. Co., Springfield, Ill.

Presses, Foot

Atlas Press Co., Kalamazoo, Mich.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lourie Mfg. Co., Springfield, Ill.
Rockford Iron Works, Rockford, Ill.
Taylor & Fenn Co., Hartford, Conn.
Partridge, E. O., 2047 W. Lake St., Chicago

Presses, Power

Loebhough-Jordan T. & M. Co., Elkhart, Ind.
Rockford Iron Works, Rockford, Ill.
Willard Press & Tool Co., Cincinnati

Presses, Punch

Enterprise Machinery Co., 32 S. Clinton St., Chicago
Henry & Wright Mfg. Co., Hartford, Conn.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Loebhough-Jordan T. & M. Co., Elkhart, Ind.
Lourie Mfg. Co., Springfield, Ill.
Partridge, E. O., 2047 W. Lake St., Chicago
Rockford Iron Works, Rockford, Ill.

Presses, Screw

Atlas Press Co., Kalamazoo, Mich.
Lourie Mfg. Co., Springfield, Ill.
Towsley Mfg. Co., John T., Cincinnati
Weaver Mfg. Co., Springfield, Ill.

Pulley Machinery

Cincinnati Pulley Mch. Co., Cincinnati

Pulleys, Iron, Solid and Split

Conway & Co., Cincinnati
Jones Superior Machine Co., 1264 W. North Ave., Chicago
National Clutch Co., 1859 Fulton St., Chicago
Fryott Fdry. Co., 628 N. Sangamon St., Chicago

Punch Press Feeds

Rockford Iron Works, Rockford, Ill.

Punches, Hand

Hendley & Whittemore Co., Beloit, Wis.

Punches, Power

Clough, R. M., Meriden, Conn.
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Long & Allstatter Co., Hamilton, Ohio
Wickes Bros., Saginaw, Mich.

Punches and Dies

Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lewthwaite Mch. Co., T. H., 418 E. 51st St., New York
North Side Tool Co., Dayton, Ohio
Rockford Iron Works, Rockford, Ill.

Reamers, Solid

Clough, R. M., Meriden, Conn.
Kelly Reamer Co., Cleveland
McCrosky Tool Corporation, Meadville, Pa.
Ready Tool Co., Bridgeport, Conn.

Reamers, Adjustable

Clough, R. M., Meriden, Conn.
Greenfield Tap & Die Co., Greenfield, Mass.
Kelly Reamer Co., Cleveland
McCrosky Tool Corporation, Meadville, Pa.
Sterling Products Co., 649 Washington Blvd., Chicago

Reamers, Cylinder

Hinckley Machine Works, Hinckley, Ill.
Kelly Reamer Co., Cleveland
McCrosky Tool Corporation, Meadville, Pa.

Reels, Extension

Cincinnati Specialty Mfg. Co., Cincinnati

Classified Finding Index

Riveting Machines

Grant Mfg. & Mch. Co. Bridgeport Conn.
High Speed Hammer Co. Rochester, N. Y.
Independent Pneumatic Tool Co. 890 W.
Jackson Blvd., Chicago

Rod Cutters

Hendley & Whittomere Co. Belsolt, Wis.
Lewthwaite Co. Geo. A. 116 Walker St. N. Y.
Tucker W. C. & F. C. Hartford Conn.

Roller Bearings

Gwilliam Co. 253 W. 58th St., New York

Sand Blast Abrasives

United States Silica Co. 1941 Peoples Gas
Bldg., Chicago

Scraping Machines, Pneumatic

Anderson Brothers Mfg. Co. Rockford, Ill.

Screw Machines, Automatic

Brown & Sharpe Mfg. Co. Providence, R. I.
Cincinnati Automatic Mch. Co. Cincinnati
National Acme Company, Cleveland
New Britain Mch. Co. New Britain, Conn.

Screw Machines, Plain or Hand

Acme Machine Tool Co. Cincinnati
Sinurr & Kamen Co. 328 N. Albany Av.,
Chicago

Wood Turret Machine Co., Brazil, Ind.

Screws, Cap and Set

National Acme Company, Cleveland

Second-Hand Machinery Dealers

Allen Mch. Co., B. C. 104 S. Clinton St.,
Chicago

Badger-Packard Mch. Co. Milwaukee Wis.
Baird Machinery Co. W. J. Detroit Mich.
Bath & Co. Cyril J. Cleveland Ohio
Bennett Machinery Co., G. L. 30 Church
St., New York

Biggs Watterson Co., Cleveland

Broadway Machinery Co. Cincinnati

Brown McDonald Mch. Co. St. Louis, Mo.

Brownell Machinery Co. Providence R. I.

Cleveland Belfing & Mch. Co. Cleveland

Dale Brewster Mch. Co. 641 Washington
Bldg. Chicago

Ensley Machinery Co., E. L., 555 Washington
Bldg. Chicago

Factory & Mill Supply Co., 137 Oliver St.,
Boston, Mass.

Federal Mch. Sales Co., 12 N. Jefferson St.,
Chicago

Fitzgerald & Co., W. H. J. Boston, Mass.

Girard Machine & Tool Co., Philadelphia

Graves Mch. Exc. 50 Church St., New York

Harris Bros. Co., W. 35th & Iron, Chicago

Hill Clarke & Co. 625 Wash. t. Bl. Chicago

Johnson & Sons Machinery Co. Wm. C.,
St. Louis Mo.

Kinsey Co., E. A., Cincinnati

Lucas & Son J. L., Bridgeport, Conn.

Lynd Farguhar Co. Boston, Mass.

McCabe Lath & Machinery Corp., J. J.,
149 Broadway New York

McCoy Brandt Mch. Co., Pittsburgh, Pa.

McMullen Mch. Co., Grand Rapids, Mich.

Marshall & Hushart Machinery Co., 17 S.
Jefferson St., Chicago

Molitor Mch. Co., Chas., 215 S. Clinton St.,
Chicago

Motch & Merryweather Mch. Co., Cleveland

Niles Bement-Pond Co., 111 Broadway N. Y.

O'Brien Machinery Co., Philadelphia

Osborne & Sexton Mch. Co., Columbus, O.

Osgood J. L., Buffalo, N. Y.

Peninsular Machinery Co., Detroit, Mich.

Prentiss & Co., Henry, Singer Bldg., N. Y.

Russell Machine Co., Pittsburgh, Pa.

Simmons Machine Co., Albany, N. Y.

Smith Machinery Co., H. A., Syracuse, N. Y.

Stocker-Rumely-Wachs Co., 117 N. Jefferson
St., Chicago

Strafer Machinery Co., Baltimore, Md.

Strong, Carlisle & Hammond Co., Cleveland.

Thompson Co., C. M., 35 S. Clinton St. Chicago

Toomey, Inc. Frank, 127 N. 3rd St., Phila.

Vonnegut Machinery Co., Indianapolis, Ind.

Walsh Machinery Co., M. J. Milwaukee, Wis.

Warner, H. D., Hartford, Conn.

Wayne Mch. Co., Fort Wayne, Ind.

White Mch. Co., A. D. 108 N. Jefferson
St. Chicago

Winterer Herman L., Philadelphia

Shafts, Flexible

Stow Flexible Shaft Co., Philadelphia

Shaping Machines

Cochrane Bly Co. Rochester, N. Y.

Columbia Machine Tool Co. Hamilton, Ohio

Davis Machine Tool Co. Rochester, N. Y.

Milwaukee Shaper Co. Milwaukee, Wis.

Osborne & Sexton Mch. Co., Columbus, O.

Rhodes Mfg. Co., Hartford, Conn.

Sellew Machine Tool Co., Pawtucket, R. I.

Simmons Machine Co., Albany, N. Y.

Smith & Mills Co., Cincinnati

Steptoe Co., John, Cincinnati

Shears, Hand

Armstrong-Blum Mfg. Co. 341 N. Francisco
Av. Chicago

Hendley & Whittomere Co., Belsolt, Wis.

Lewthwaite Co. Geo. A. 116 Walker St. N. Y.

Tucker, W. C. & F. C. Hartford, Conn.

Shears, Power

Hendley & Whittomere Co., Belsolt, Wis.

Long & Allstatter Co., Hamilton, Ohio

Sine Bars

Way Co., A. F., Hartford, Conn.

Slotting Machines

Cough, R. M., Meriden, Conn.

Rhodes Mfg. Co., Hartford, Conn.

Stock Supports

Racine Tool & Machine Co., Racine, Wis.

Way Co., A. F., Hartford, Conn.

Swaging Machines

Etna Mfg. Co., Toledo Ohio

Tables, Circular

Cochrane-Bly Co. Rochester, N. Y.

Hinchley Machine Works, Hinchley, Ill.

Lewthwaite Co. Geo. A., 116 Walker St., N. Y.

Tap Extractors

Walton Co., Hartford, Conn.

Tap Wrenches

Alert Tool Co., Philadelphia

Tapping Machines and Attachments

Beaman & Smith Co., Providence, R. I.

Burke Machine Tool Co., Conneaut, Ohio

Cincinnati Pulley Machinery Co., Cincinnati

Fenn Mfg. Co., Hartford, Conn.

Greenfield Tap & Die Corp., Greenfield, Mass.

Hammond Mfg. Co., Cleveland

McCrosky Tool Corporation, Mendville, Pa.

Modern Tool Co., Erie, Pa.

Rickert Shafter Co., Erie, Pa.

Turner Machine Co., Danbury Conn.

Webster & Perks Tool Co., Springfield, Ohio

Whitney Mfg. Co., Hartford, Conn.

Workwell Eng. & Mfg. Co., 616 W. Monroe
St., Chicago

Taps, Collapsing

Murphy Machine & Tool Co., Detroit, Mich.

Taps and Dies

Greenfield Tap & Die Corp., Greenfield, Mass.

National Acme Company, Cleveland

Thread Cutting Tool Rigs

G. L. Sales Co., 621 W. 29th St., New York

Thread Milling Machines

Waltham Machine Works, Waltham, Mass.

Threading Tools

Armstrong Bros. Tool Co., 308 N. Francisco
Av. Chicago

Greenfield Tap & Die Corp., Greenfield, Mass.

Modern Tool Co., Erie, Pa.

Murphy Machine & Tool Co., Detroit, Mich.

National Acme Company, Cleveland

Ready Tool Co., Bridgeport, Conn.

Classified Finding Index

Tool Holders

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Ready Tool Co., Bridgeport, Conn.
Wiggins & Co., A. V., Syracuse, N. Y.
Wood Turret Machine Co., Brazil, Ind.

Tools, Boring

Alert Tool Co., Philadelphia
Armstrong Bros. Tool Co., 308 N. Francisco
Kelly Reamer Co., Cleveland [Av., Chicago
Unity Mfg. Co., Cleveland

Tools, Lathe and Planer

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Ready Tool Co., Bridgeport, Conn.

Tools, Machinists'

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Brown & Sharpe Mfg. Co., Providence, R. I.

Tools, Spot Facing

Genesee Mfg. Co., Rochester, N. Y.

Tools, Rounding Machines

Cross Gear & Engine Co., Detroit, Mich.

Trucks, Machine Shop

New Britain Machine Co., New Britain, Conn.
Towsley Mfg. Co., John T., Cincinnati

Turntables

Canton Foundry & Machine Co., Canton, O.

Turret Heads, for Lathes

Newman Mfg. Co., Cincinnati

Valve Seat Planing Machines, Portable

Stow Flexible Shaft Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Vises, Drilling Machine

Ainslie Mch. & Tool Works, Hartford, Conn.
Armstrong-Bium Mfg. Co., 341 N. Francisco
Av., Chicago

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago

Carter & Hakes Mch. Co., W. Winsted, Conn.
Hogson & Pettin Mfg. Co., New Haven, Conn.
Hollands Mfg. Co., Erie, Pa.
Jahant Foundry & Heating Co., Akron, Ohio
Martin Tool & Die Co., Springfield, Ohio
Massey Vice Co., 549 Wash't'n Blvd., Chicago
Nestor Mfg. Co., 40 W. 13th St., New York
Thomas Elevator Co., 31 So. Hoyne Ave.,
Yost Mfg. Co., Meadville, Pa. [Chicago

Vises, Machinists'

Hollands Mfg. Co., Erie, Pa.
Jahant Foundry & Heating Co., Akron, Ohio
Massey Vice Co., 549 Wash't'n Blvd., Chicago
New Britain Machine Co., New Britain, Conn.
Yost Mfg. Co., Meadville, Pa.

Vises, Milling Machine

Carter & Hakes Mch. Co., W. Winsted, Conn.
Cochrane-Bly Co., Rochester, N. Y.
Edlund Machinery Co., Inc., Cortland, N. Y.
Hardinge Brothers, 1770 Berceau Av., Chicago
Hartford Special Mch. Co., Hartford, Conn.
Hollands Mfg. Co., Erie, Pa.
Massey Vice Co., 549 Wash't'n Blvd., Chicago
Nestor Mfg. Co., 40 W. 13th St., New York
Sellew Machine Tool Co., Pawtucket, R. I.
Spafford Tool Works, Hartford, Conn.
Steptoe Co., John, Cincinnati
Yost Mfg. Co., Meadville, Pa.

Vises, Shaper

Steptoe Co., John, Cincinnati

Wood Working Machinery

Chicago Mch. Exchange, 1211-27 Washington
Bld., Chicago
Hendley & Whittmore Co., Beloit, Wis.
Jones Superior Machine Co., 1264 W. North
Av., Chicago
Silver Mfg. Co., Salem, Ohio
Towsley Mfg. Co., John T., Cincinnati
Whitney & Son, Baxter D., Winsted, Mass.

New Boston Show Rooms

W. H. J. Fitzgerald & Co.

30 Oliver St., Boston

- 1 Foote-Burt Company No. 23 Heavy Duty Drill, 20" swing, single belt drive, capacity $\frac{3}{8}$ " to $1\frac{1}{4}$ ", guaranteed good as new.
- 2 No. 2 Warner & Swasey Turret Screw Machines, plain head, automatic chuck, bar feed, hand longitudinal feed to cut-off, with power feed to hexagon turret.
- 2 No. 1 Warner & Swasey Turret Screw Machines, plain head, automatic chuck, bar feed, lever feed to cut-off only, automatic chuck capacity $\frac{3}{8}$ ".

These machines are in A-1 condition.

Six $\frac{1}{4}$ Inch Automatic Screw Machines (Stehli Patent)

Each fitted with screw slotting attachment. Manufactured by Hartford Machine Screw Company. These machines adapted to the rapid production of all kinds of small screws, bushings, studs, etc. Condition, good as new.

Pattern Shop Machinery

Special Prices if you refer to this ad.



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Chicago No. 00 27 in. Wheels
 " No. 0 32 " "
 " No. 1 36 " "



Saw Tables

Chicago No. 5 Stationary Table
 " No. 9 Tiling Table
 " No. 10

Boring attachment if wanted.

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8 in., 5 and 6 ft. tables and guard.
 12, 16, 20, 24 and 30 in., 7 ft. tables
 and guard.

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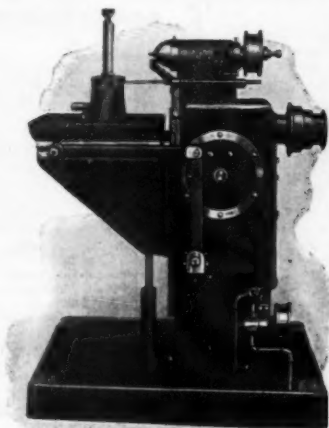
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24 Teeth a Minute—Guaranteed



Guaranteed to round 24 teeth a minute, any pitch $\frac{1}{2}$ or finer. Handles gears of any number of teeth from 8 to 250, including all prime numbers. Every tooth is a perfect half-circle from tip to root—the only perfect form for sliding mesh gears. The only machine that will successfully round tractor teeth on a production basis.

**It has revolutionized both cost and quality
Don't you want to know more about it?**

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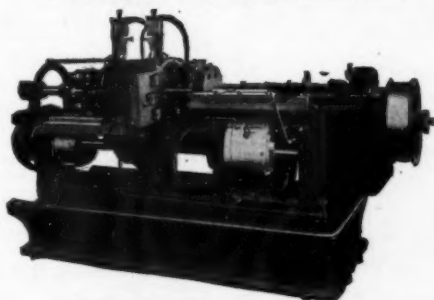
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In Blanking Rolls, Sleeves, Pipe Couplings, Nuts, Stud Blanks, etc.



"N-B" Sextuple Automatic Bar Machine

It will feed, drill, face, chamfer and cut off in six spindle positions at the same time.

On simple work, such as rolls, sleeves, pipe couplings, stud blanks, etc., its productive capacity is nearly six times that of single spindle automatics.

A machine of great convenience and "New Britain" quality of construction, designed to multiply output and reduce costs to the lowest basis.

Bulletin No. 955 shows full-size illustrations of work it will do and production records on each

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Automatic
Screw and Chucking
Machines



New Britain,
Connecticut,
U.S.A.

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10 sizes—8"x18" to 16"x60"
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One model with fixtures in 3 Sizes.
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For any chasers with parallel sides and general tool room work.
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For driving tools "through" or "to bottom."

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**"Shop Furniture
Originators"**



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